

FINAL REPORT

EES/Project No. A-3378



THE PRODUCTIVITY INFRASTRUCTURE OF THE UNITED STATES

By

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Prepared for

THE UNITED STATES DEPARTMENT OF COMMERCE

Under

Grant No. 99-05-07129

JANUARY 1984

GEORGIA INSTITUTE OF TECHNOLOGY

A Unit of the University System of Georgia

Engineering Experiment Station

Atlanta, Georgia 30332



1984



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This technical assistance program was accomplished by professional consultants under a grant from the Economic Development Administration. The statements, findings, conclusions, recommendations, and other data in this report are solely those of the grantee and do not necessarily reflect the views of the Economic Development Administration.

Economic Development Laboratory
GEORGIA INSTITUTE OF TECHNOLOGY
January 1984

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ACKNOWLEDGEMENTS

This report, in its various stages, stimulated many helpful comments, which the research team would like to acknowledge here. Valuable suggestions were received as the report was being conceived from Mr. Egils Milbergs, Director, Office of Productivity, Technology and Innovation, as well as from Mr. Paul Bradon and Mr. Tip Parker. Also, thanks to Mr. States Clawson, Manager, Productivity Center, at the U.S. Department of Commerce.

The advisory committee for the study interacted very productively with the research staff and provided many valuable suggestions. The advisory committee comprised Dr. Gary Hansen, Director, Utah Center for Productivity and Quality of Working Life; Dr. LeRoy Marlow, Director, Pennsylvania Technical Assistance Program; Dr. Scott Sink, Director, Oklahoma Productivity Center; Dr. William Smith, Director, Productivity Research and Extension Program; and Dr. Thomas Tuttle, Director, Maryland Center for Productivity and Quality of Working Life. Finally, we are indebted to Mrs. Diane Robertson for her typing of the report.

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INTRODUCTION

Productivity in the last decade has received increasing attention from the private sector as well as from many levels of government. A wide variety of productivity improvement activities have been initiated by many diverse organizations.

Indeed, one salient aspect of these productivity organizations is their diversity. They vary widely in terms of their character, the resources available to them, and the types of clients they serve.

In September 1982, the U.S. Department of Commerce funded a study to be conducted by the Georgia Institute of Technology. The objectives of this study were:

- o to identify and characterize the productivity organizations which comprise the national productivity infrastructure
- o to identify strategic opportunities for the various types of productivity organizations
- o to disseminate the findings of the research.

As a result of this research project, the following ends were accomplished, along with the objectives stated above:

- o A focal point was provided for coordinating the activities of the productivity organizations in the conceptualization of a National Productivity Network.
- o Leadership was provided to advance the common goal of improving national productivity.
- o Common productivity problems and concerns were identified, and their solutions were formulated.

THE NATION'S PRODUCTIVITY GROWTH

Economic progress allows a nation to raise the standard of living of its citizens. Increases in national productivity, that is, the production of more goods and services through a more efficient use of such resources as capital and labor, are the key to economic progress.

The importance of productivity increases and the critical nature of the relationship between productivity increases and the ability of our nation to compete effectively and maintain its standard of living have emerged as major concerns among both private sector and government leaders.

The complacency which existed for many years with regard to the nation's productivity growth has fortunately been replaced with concern as the difficult realities of the nation's ability to compete and maintain its standard of living have come into focus.

An important element of any sound response to the nation's need for a comprehensive strategy on productivity is to identify and understand the organizations that comprise the nation's productivity infrastructure.

These productivity organizations have been shaped by the environment in which they operate. To obtain the proper perspective on their role in increasing productivity growth, it is useful to examine national productivity trends, each nation's position relative to that of its competitors, and proposed policies designed to address productivity issues.

Within the text of the report issues have been identified and highlighted in bold print. An "issue" in this context is defined as an area of significant concern in which direct action needs to be taken to ensure improved national productivity.

Issue: During the 1970s and early 1980s, the nation's productivity growth rate did not attain its potential and the nation experienced a lower productivity growth rate than did its competitors in the international marketplace.

Productivity statistics are commonly presented in terms of either of two measures: labor productivity or total-factor productivity. Whatever productivity statistic is employed, the conclusions remain essentially the same: the nation has experienced a definite slowdown in the rate of productivity growth and this slowdown has been pervasive in effecting almost all major segments of the private business sector.

Labor productivity measures output per hour and is a significant determinant of the nation's standard of living. Table 1 shows the output per paid hour in the private business sector. This important productivity index measures growth at an annual rate of 3.2% from 1947 to 1965. However, between 1965 and 1982 a productivity slowdown occurred, with the average annual growth of 1.5% constituting less than half the annual rate experienced during the previous period. Between 1977 and 1982 business sector productivity, that is the output

Table 1

Business Sector Productivity

Year	Output Per Paid Hour	
	Index (1977=100)	Annual Percent Change ¹
1960	65.2	1.5
1965	78.3	3.5
1970	86.2	0.9
1974	92.6	-2.3
1975	94.7	2.3
1976	97.6	3.1
1978	100.6	0.6
1979	99.6	-0.9
1980	98.9	-0.7
1981	100.3	1.4
1982	100.2	0.0

¹ Changes for 1960, 1965, 1970, 1974, and 1978 are from the immediately prior year.

Source: U.S. Department of Commerce, Bureau of the Census, Statistical Abstract of the United States, 1982-3, and U.S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, August 1983.

per paid hour, has essentially not changed. In 1974, 1979, and 1980, this productivity measure exhibited negative growth rates of -2.3%, -0.9%, and -0.7%.

In a recent Brookings Institute Study, Baily examined specific industry groups which comprise the private business sector and the specific industries which comprise the manufacturing sector to determine the origin of the nation's productivity slowdown. Tables 2 and 3 describe the productivity growth slowdown in the major industry groups of the private business and manufacturing sectors using a total factor productivity measure. The industry groups have been categorized by the magnitude of their productivity slowdowns, which presents the difference between average annual growth of total-factor productivity before and after 1973.

As can be seen from the data during the 1970s and early 1980s, the nation experienced a decrease in productivity growth when compared with previous years. Since the production of goods and services has been less efficient, the amount of goods and services available for distribution to the nation's citizens is less than it potentially could be, and hence the standard of living is reduced.

The impact of changes in productivity on standard of living can be quantified. A measure of standard of living is real wages or compensation per hour. Real wages is what consumers have to spend after taxes and inflation have been factored out of wages. The Bureau of Labor Statistics data show that, at least since 1950, there has been a close correlation between productivity and real wages. If, for instance, productivity increases, so do real wages. Unfortunately, for about the past 10 years, as productivity leveled off and started to decline, so has the standard of living as measured by real, spendable average weekly earnings.

Economic progress has been negatively affected by this productivity slowdown. Equally important is the standard of living of the United States compared with that of the rest of the world. The U.S. today competes in the international market, and how well it

Table 2

**Productivity Growth Slowdown in
the Private Business Sector**

<u>Productivity Slowdown (percentage points per year)</u>	<u>Industry</u>
Small, 1.09 to -0.35	Communications, services, real estate, agriculture
Medium, -0.61 to -1.81	Finance and insurance, nonrail transportation, manufacturing railroads, trade
Large, -3.70 to -5.08	Construction, public utilities, mining

¹Number represents difference between average annual growth of total-factor productivity in 1973-1981 and 1953-1973

Source: Martin Neil Baily, "The Productivity Growth Slowdown by Industry," Brookings Papers on Economic Activity, No. 2, 1982, pp. 437-438.

Table 3

**Productivity Growth Slowdown in
Manufacturing Industries**

<u>Productivity Slowdown (percentage points per year)</u>	<u>Industry</u>
No slowdown, 2.16 to 0.14	Furniture, leather, apparel
Small, -0.25 to -0.83	Nonelectrical machinery; stone, clay and glass; fabricated metals; textiles; electrical machinery
Medium, -1.19 to -1.85	Tobacco, instruments, primary metals, miscellaneous manufacturing, rubber, paper, food
Large, -2.16 to -4.86	Transportation equipment, printing, lumber chemicals, petroleum refining

¹Number represents difference between average annual growth of total-factor productivity in 1973-1981 and 1953-1973

Source: Martin Neil Baily, "The Productivity Growth Slowdown by Industry," Brookings Papers on Economic Activity, No. 2, 1982, pp. 437-438.

competes determines its relative economic position in the world community. Table 4 shows "United States and World Exports." As can be seen, the United States' share of world exports has declined from 16.7% in 1950 to 10.9% in 1980.

An examination of the structure of world trade for 1979 shows that manufactured goods accounted for 59.8% of world exports. Table 5 compares manufacturing productivity growth rates for the United States and selected competitors. In most instances the United States has experienced a much lower productivity growth rate, especially in the 1975-1980 period, than did other industrialized countries. Because manufacturing goods are a major segment of the world market, relatively lower productivity growth rates in the U.S. manufacturing sector will lower the nation's standard of living relative to that of other nations over time. The nation's economic progress, then, depends on its level of productivity as compared to that of the rest of the world, as well as on increases in the nation's productivity level from one year to the next.

Productivity measures provide insight into the performance of the United States' economy over time and in relation to other countries. Productivity trends show where the nation has been, but what is needed is information identifying and explaining the reasons for these trends.

Many statistical studies have been done on productivity trends and their causes. Denison^{1/} has provided one of the most comprehensive treatments in his analysis of productivity growth and the factors which influence it.

Issue: The incorporation into production of knowledge new to the organization, whether it be managerial, organizational, or technological, is the key factor in increasing productivity growth.

^{1/} Edward F. Denison, Accounting for Slower Economic Growth: The United States in the 1970s, Washington, D.C.: The Brookings Institution, 1979.

Table 4

United States and World Exports
(in million U.S. dollars)

<u>Year</u>	<u>World Exports</u>	<u>United States Exports</u>	<u>United States Percent of World Exports</u>
1950	60,785	10,149	16.7
1960	128,275	20,412	15.9
1970	313,860	42,590	13.5
1980	1,988,005	216,668	10.9

Source: United Nations, 1980 Yearbook of International Trade Statistics, Volume 1, Trade by Country.

Table 5

Comparative International Manufacturing Productivity

	<u>Average Annual Percent Change in Output Per Hour</u>		
	<u>1970-1975</u>	<u>1975-1980</u>	<u>1980-1981</u>
United States	3.4	1.7	2.8
Belgium	7.7	6.7	7.3
Canada	3.4	2.1	.3
Denmark	7.7	4.0	5.6
France	4.6	4.9	1.6
Germany, Federal Republic	5.5	4.3	2.7
Italy	4.6	5.1	3.4
Japan	6.8	8.0	3.2
Netherlands	6.2	5.7	3.1
Sweden	4.2	2.4	1.0
United Kingdom	3.3	2.6	5.9

Source: U.S. Department of Commerce, Bureau of the Census, Statistical Abstract of the United States, 1982-83, and U.S. Department of Labor, Bureau of Labor Statistics, A BLS Reader on Productivity, Bulletin 2171, June 1983.

During the period 1948 to 1973, growth in total productivity according to Denison, was 2.6% a year, of which advances in knowledge accounted for 53.8%, capital for 15.4%, improved allocation of resources for 15.4%, economies of scale from larger markets for 15.4%, and labor for 3.8%.

Advances in knowledge is a measure defined by Denison as the "incorporation into production of new knowledge of any type -- managerial and organizational as well as technological -- regardless of the source of the knowledge, the way it is transmitted to those who can make use of it, or the way it is incorporated into production."^{2/}

Capital accounted for 15.4% of the increase in productivity growth between 1948 and 1973. This reflects an increase in the amount of capital per person due to increases in the quantity of inventories, buildings, and equipment per person employed. A negative influence was the decrease in the land available per worker as employment increased.

Improved allocation of resources and economics of scales from larger markets each contributed 15.4% to the increase in productivity between 1948 and 1973.

Labor accounted for 3.8% of the productivity growth from 1948 to 1973. Several factors, some negative and others positive, were responsible. Negative factors were the reduction in the average hours at work and changes in the age-sex composition of the work force. The increases in the proportion of youths and women in the labor force, whose output is lower relative to the proportion of males 35 to 64 years of age, has adversely affected productivity. However, the significant increase in the educational level of employed persons has outweighed the negative influences and resulted in a positive contribution by labor to productivity growth.

Insight into the causes of the productivity slowdown can be obtained by comparing this historical data on contributions to productivity growth with the experiences of recent years.

^{2/} Edward F. Denison, "Explanations of Declining Productivity Growth," Survey of Current Business, August 1979, p. 4.

Productivity growth fell from 2.6% a year to -0.6% in the period 1973 to 1976, a decrease of 3.2 percentage points. Advances in knowledge amounted for 68.8% of the drop in the productivity growth rate, while changes in the legal and human environment, such as pollution abatement, accounted for 12.5% of the decrease, and other factors accounted for the remaining 18.7%.

In addition to the research on the causes of the productivity slowdown by Denison, other economists have devoted considerable effort to quantifying the factors.^{3/} Although the importance of each factor varies according to the research approach employed, there is general agreement on which factors are relevant.

The nation's productivity trends and the causes of the productivity slowdown have been presented in order to provide a basis on which to evaluate the role of productivity organizations. The objectives of the productivity organizations are very similar to what Denison defined as advances in knowledge. Their objective is to facilitate the incorporation into production of knowledge new to the organization, whether it be managerial, organizational, or technical in orientation, by assistance, research, and training.

Productivity organizations represent a necessary element in a comprehensive strategy to stimulate productivity. The prestigious Committee for Economic Development has made an insightful observation on policies and programs for productivity improvements. The committee states: "It must be understood that there is a difference between conditions that are necessary and conditions that are sufficient for solution of the problem. A policy that takes a necessary step toward solution of the productivity problem may be regarded as a commendable

^{3/} John W. Kendrick and Elliot S. Grossman, Productivity in the United States: Trends and Cycles. Baltimore: The Johns Hopkins University Press, 1980. J.R. Norsworthy, Michael J. Harper, and K. Kunze, "The Slowdown in Productivity Growth: Analyses of Some Contributing Factors," Brookings Papers on Economic Activity, No. 2, 1979. Martin Neil Baily, "The Productivity Growth Slowdown by Industry," Brookings Papers on Economic Activity, No. 2, 1982 pp. 437-438.

initial move without which there would be no hope of achieving the desired goal, but by itself is not adequate for that purpose. In contrast, a program that promises to be sufficient for the achievement of the selected goals is one that can be expected not only to move matters in the right direction, but also to do so by the required magnitude."^{4/}

There is no shortage of policy prescriptions for stimulating productivity from private organizations and from the input provided to the president's National Productivity Advisory Committee and in congressional hearings. Proper government policies are important and necessary in that they definitely influence the environment in which businesses operate. For instance, the Economic Recovery Tax Act of 1981 contained provisions aimed at stimulating research and development expenditures by businesses, and thereby had a positive effect on the rate of innovation.

Determining proper government policies is not as self-evident a process as it might at first appear. For instance, a policy recommendation for stimulating productivity which is invariably mentioned is to remove impediments to saving to increase the level of business investment. The evidence indicates, however, "that inadequate investment is not responsible for the productivity slowdown."^{5/}

As the Committee for Economic Development has indicated, "however great the importance of proper government policies," the "critical role in productivity performance is played by business management." The productivity organizations see their role as working as agents of change with that segment of the economy which accounts for the majority of new jobs -- the small- and medium-sized businesses. These businesses, in most instances, do not have the expertise to apply or

^{4/} Committee for Economic Development, Productivity Policy: Key to the Nation's Economic Future, April 1983, page 18.

^{5/} Martin Neil Baily, "The Productivity Growth Slowdown by Industry," Brookings Papers on Economic Activity, No. 2, p. 456.

remain current on the array of managerial techniques and emerging or existing technologies.

As economists have long recognized, "the transfer of technology is at the heart of the process of economic growth, and the progress of countries depends on the extent and efficiency of such transfer."^{6/}

^{6/} Edwin Mansfield, Anthony Romeo, Mark Schwartz, David Teece, Samuel Wagner, Peter Brach, Technology Transfer, Productivity, and Economic Policy, 1982, p. 208.

METHODOLOGY

Many different types of productivity organizations are active across the United States. These organizations vary widely in terms of their operations, their resources, and the audience they serve. Some are small; a few are large. Some focus on technology, some on human resources, and others focus on both of these concerns. Every productivity organization stresses the importance of improvement through a wide variety of projects. These projects have increased efficiency and effectiveness in both private industries and public agencies.

Universe

Many organizations take actions to affect productivity. Under the guidance of the productivity advisory committee, criteria were developed which helped define the universe of organizations comprising the national productivity infrastructure. These criteria are:

- o Is the organization devoted primarily to productivity improvement in either the public or private sector?
- o Does the organization have recognition, as evidenced by local and national support and visibility, a charter, or other formal authorization?

By these criteria, professional societies such as the Institute of Industrial Engineers, innovation centers, and private and for-profit firms such as Peat Marwick Mitchell and Co. fall outside the national productivity infrastructure. As a result of the advisory committee's input, this study characterizes productivity organizations that meet two specific criteria: a primary mission of productivity improvement within a nonprofit structure.

Classification Scheme

The productivity advisory committee addressed the question of whether it would be possible to develop a meaningful classification scheme of productivity organizations that would facilitate the collection, reduction, and analysis of data. The general agreement

was that such a classification scheme was possible and would be very useful.

The Georgia Tech staff refined the classification developed during the advisory committee meeting and used the following classification scheme for productivity organizations during the data collection phase of the research. Productivity organizations were classified depending on whether their major activity was in the human relations, management, or technical area. As the study progressed, combinations of the above areas were added to reflect organizations which indicated their major activity was in more than one area. The three additional categories are human relations/management, management/technical, and human relations/management/technical.

1. **Human relations** oriented productivity organizations concentrate on the employee-related functions of organizations. Typical areas of involvement include: quality of work life issues, wage and salary program development, training, government regulation compliance and union-management relationships.
2. **Management** oriented productivity organizations address two major areas: (1) administration and (2) management proper. Programs involved in administration normally work to guide organizations in the overall determination of policies and objectives and in the coordination of marketing, finance, production, and distribution. In management proper, the concern is with the execution of policies and plans through directing and controlling.
3. **Technical** oriented productivity organizations seek improvements in productivity through changes in production, materials, methods, and machinery, which, in turn, stem from the accumulation of technological knowledge. Specific examples of areas involved are: equipment modification, cost reduction, plan layout, software evaluation, and energy conservation.

Data Sources

The objective of the data gathering was to obtain information which would identify and characterize the productivity organizations which comprise the national productivity infrastructure, determine the "gaps" among the various centers in terms of services provided, and to identify strategic opportunities for productivity organizations.

It was apparent that very little published data existed and to obtain current and timely information, primary data collection methods would have to be employed. Advisory committee meetings and contact with the productivity organizations by telephone and on-site visits provided the data needed. Members of the advisory committee were:

Dr. Gary Hansen, Director
Utah Center for Productivity and Quality of Working Life

Dr. LeRoy Marlow, Director
Pennsylvania Technical Assistance Program (PENNTAP)

Dr. Scott Sink, Director
Oklahoma Productivity Center

Dr. William Smith, Director
Productivity Research and Extension Program

Dr. Thomas Tuttle, Director
Maryland Center for Productivity and Quality of Working Life

Telephone Contacts

The Georgia Tech list of productivity organizations was checked for completeness against published data sources, such as the National Directory of Centers for Productivity and Quality of Work Life and the Directory of U.S. Productivity and Innovation Centers.

An attempt was made to contact 98 organizations to obtain current information on:

- o name, address, and title of person to be contacted
- o the major orientation of the productivity organization (i.e., human relations, management, or technical)

- o the percentage of total expenditures spent on assistance, education, publication, research, and other
- o year established
- o staff size in terms of professionals and support
- o relationships with other productivity organizations

Of the 98 organizations, 51 were eliminated because they didn't meet the criteria established for inclusion in the productivity infrastructure, and three organizations were not included in the data analysis because they could not be reached or because complete information could not be obtained.

A number of productivity services users were contacted by telephone. Since the productivity organizations offer quite diverse services, only general comments were solicited in these areas:

- o name, address, and title of respondent
- o verification of productivity service description
- o comments on value of service
- o productivity services needed
- o implementation of recommendations
- o how contact was established

On-Site Visits

The advisory committee was asked to help identify "representative" productivity organizations to be contacted for in-depth personal interviews. "Representative" organizations were selected for in-depth interviews since experience has shown that there is a point of diminishing return in collecting information, that is, additional interviews yield little new data.

The advisory committee evaluated a list of 98 productivity organizations to identify those organizations which were "representative" in terms of classification, activities, staff size, budget, nature of programs, time in business, accomplishments and geography. As a result of this evaluation, the following organizations were selected for on-site interviews based on the advisory committee's judgment about the nature of their major orientation. The

manner in which the productivity organizations actually classified themselves with respect to major orientation is shown on pages 36-38.

Human Relations

1. Center for the Improvement of Productivity
Fairfax, VA
2. Maryland Center for Productivity & Quality of Working Life
College Park, MD
3. Michigan Quality of Work Life Council
Troy, MI
4. National Center for Public Productivity
New York, NY
5. Texas Center for Productivity and Quality of Work Life
Lubbock, TX
6. Utah Center for Productivity and Quality of Working Life
Logan, Utah
7. Work In America Institute
Scarsdale, N.Y.

Management

1. American Productivity Center
Houston, TX
2. Oklahoma Productivity Center
Stillwater, OK
3. Productivity Center
Chamber of Commerce
Washington, D.C.
4. Oregon Productivity Center
Corvallis, OK

Technical

1. Georgia Productivity Center
Atlanta, GA
2. Manufacturing Productivity Center
Chicago, IL

3. Pennsylvania Technical Assistance Program (PENNTAP)
University Park, PA
4. Productivity Extension Program
Raleigh, N.C.
5. Productivity Evaluation Center
Blacksburg, VA
6. Texas Hospital Association Statewide Productivity Center
Austin, TX

As stated, for the productivity organizations selected for in-depth analysis, an attempt was made to identify "representative" human relations, management, and technical organizations. Although they provide diverse services, their activities can be categorized into research, assistance, education, and publications. The activities of most productivity organizations primarily focus on one of these categories.

The productivity organizations within the human relations classification, for example, were selected to reflect specific orientations within that specific area. The orientation of the Center for Productivity Studies is research, the Maryland Center for Productivity & Quality of Working Life focuses on assistance, the National Center for Productivity concentrates on education, and the focus of the Work in America Institute is publications.

The advisory committee identified 18 productivity organizations to be interviewed; however, during the research several organizations were eliminated from the study and others added so that in-depth interviews were conducted with 17 representative organizations.

The personal interviews were conducted using a semi-structured approach. An interview instrument was developed which covered a number of issues. The on-site interview format was open-ended and, hence, allowed the respondent freedom of expression. Information collected addressed the following:

- o primary mission of organization
- o nature and work of organization

- o organizational techniques and resources
- o major strengths of organization
- o organization's most successful project
- o organizational problems and needs
- o organizational changes envisioned for the next five years
- o future productivity issues
- o ideal productivity organization

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CHARACTERIZATION OF PRODUCTIVITY ORGANIZATIONS

This examination of the characteristics of the nation's productivity infrastructure was based on the data obtained from the interviews as well as from published sources. An overview of the productivity infrastructure is provided in the analysis of key parameters such as major orientation and size. The productivity services coverage, that is, the level of services provided by the productivity infrastructure in relation to the demand for services, is examined.

With the general characteristics of the productivity infrastructure established, a framework is provided to interpret the data collected from the "representative" productivity organizations. The information provided from these in-depth interviews is presented in the next section in a narrative format, along with the opportunities and problems which face all productivity organizations similar to these "representative" ones.

Issue: Productivity organizations, in general, are small and very limited with regard to the resources they can draw upon and range of productivity services they offer.

Analysis of Productivity Organizations

A profile of the nation's productivity infrastructure was prepared using the information gathered during the telephone interviews. The productivity organizations are analyzed by size, major orientation, and major areas of activity.

The nation's productivity infrastructure contains 44 organizations which had an equivalent of 1,139 full-time employees. Appendix A contains a directory of the productivity organizations. Approximately 62%, or 710, of these employees were professionals, with the remaining 38%, or 429, working as support staff. The average productivity organization employed the equivalent of about 26 people, with a professional staff of 16 and a support staff of 10.

The large productivity organizations have a substantial influence on the average staff size, as can be seen from a comparison of the mean values with the average values for total staff of 10, professional staff of 5, and support staff of 3.

The productivity organizations were asked to indicate the percent of their annual budget that was spent on assistance, education, publication, research, and other. These estimates were used to allocate full-time equivalent employees to each of the categories.

Assistance (31.9%), education (25.6%), and research (29.6%) accounted for almost equal proportions of the productivity organizations' efforts. Publications (11.7%) and other (1.3%) accounted for the remainder of the resources.

The productivity organizations were asked to indicate their major orientation, such as human relations, management, or technical (see methodology section for definitions). Their response indicated the need to establish classifications which used more than one thrust (see Tables 6 and 7).

Twenty-three productivity organizations indicated a major component of their orientation was human relations. A human relations orientation was the single thrust for 14 organizations, and an element for another nine organizations which indicated multiple thrusts.

Twenty-two productivity organizations indicated a major component of their orientation was management. A management orientation was the single thrust for seven organizations, and an element for another 15 organizations which indicated multiple thrusts.

Seventeen productivity organizations indicated a major component of their orientation was technical. A technical orientation was the single thrust for eight organizations, and an element for another nine organizations which indicated multiple thrusts.

Human Relations Orientation

The Human Relations classification represents 31.8% of the organizations (see Table 7). These 14 organizations account for 22.6%

Table 6
Characteristics of Productivity Organizations by Size¹

	<u>Size of Productivity Organization²</u>			<u>Total</u>
	<u>Small</u>	<u>Medium</u>	<u>Large</u>	
Productivity Organizations				
Number	23	15	6	44
Percent of total universe	52.3	34.1	13.6	100.0
Number of Employees				
Professional	64.8	208.7	437	710.5
Staff	41.8	109.2	278	428.9
Total	106.5	317.9	715	1139.4
Percent of total universe	9.3	27.9	62.8	100.0
Average Number of Employees				
Professional	2.8	13.9	72.8	16.1
Staff	1.8	7.3	46.3	9.7
Total	4.6	21.2	119.2	25.9
Major Orientation				
<u>Human Relations</u>				
Number	7	6	1	14
Percent of size category	30.4	40.0	16.7	31.8
<u>Human Relations/Management</u>				
Number	4	0	2	6
Percent of size category	17.4	0	33.3	13.6
<u>Management</u>				
Number	5	2	0	7
Percent of size category	21.7	13.3	0	15.9
<u>Management/Technical</u>				
Number	2	2	2	6
Percent of size category	8.7	13.3	33.3	13.6
<u>Technical</u>				
Number	4	3	1	8
Percent of size category	17.4	20.0	16.7	18.2
<u>Human Relations/Technical/Management</u>				
Number	1	2	0	3
Percent of size category	4.3	13.3	0	6.8
Percent of Organization's Efforts				
Assistance	31.8	28.8	33.2	31.9
Education	16.7	30.2	24.8	25.6
Publications	10.9	11.7	11.8	11.7
Research	32.1	27.5	30.2	29.6
Other	8.5	1.7	0	1.3

¹ Due to rounding, the totals will not necessarily add to sum of elements.

² Small organizations range in size from .5-10 employees; medium organizations from 12-34 employees; and large organizations from 50-250 employees.

Source: See Appendix Table C-2.

Table 7

Characteristics of Productivity Organizations by Major Orientation¹

	<u>Human Relations</u>	<u>Human Relations/ Management</u>	<u>Management</u>	<u>Management/ Technical</u>	<u>Technical</u>	<u>Human Relations/ Technical/Management</u>
Productivity Organizations						
Number	14	6	7	6	8	3
Percent of total universe	31.8	13.6	15.9	13.6	18.2	6.8
Size of Productivity Organization²						
<u>Small</u>						
Number	7	4	5	2	4	1
Percent of size category	30.4	17.4	21.7	8.7	17.4	4.3
<u>Medium</u>						
Number	6	0	2	2	3	2
Percent of size category	40.0	0	13.3	13.3	20.0	13.3
<u>Large</u>						
Number	1	2	0	2	1	0
Percent of size category	16.7	33.3	0	33.3	16.7	0
Number of Employees						
Professional	108	85.0	41.8	183	254.7	38
Staff	149	49.5	15	110.2	79.2	26
Total	257	134.5	56.8	293.2	333.9	64
Percent of total universe	22.6	11.8	5	25.7	29.3	5.6
Average Number of Employees						
Professional	7.7	14.2	6	30.5	31.8	12.7
Staff	10.6	8.2	2.1	18.4	9.9	8.7
Total	18.4	22.4	8.1	48.9	41.7	21.3
Percent of Organization's Efforts						
Assistance	25.3	19.3	25.7	50.6	29.9	14.8
Education	20.6	48.8	37.3	21.5	17.7	46.3
Publications	15.8	8.6	9.5	10.9	8.4	24.2
Research	35.8	23.3	20.4	17.0	42.9	14.8
Other	2.5	0	7	0	1.2	0

¹ Due to rounding, the totals will not necessarily add to sum of elements.

² Small organizations range in size from .5-10 employees; medium organizations from 12-34 employees; and large organizations from 50-250 employees.

of the total number of employees in the productivity infrastructure. Human relations organizations employ an average of 7.7 equivalent full-time professionals and 10.6 support staff, for an average total of 18.4 employees.

The distribution of human relations organizations' efforts in assistance, education, publication, research, and other, as compared with the nation's distribution, is more evenly distributed, with major emphasis in the area of research, which accounts for 35.8% of the person years, compared to 29.6% of the nation's.

Management Orientation

Management organizations account for 15.9% of the organizations. The seven organizations represent 5.0% of the total employment in the productivity infrastructure. The average management organization had the full-time equivalent of 8.1 employees, of which 6.0 were professionals and 2.1 were support staff.

The management organizations concentrate their efforts in the areas of assistance and education, which account for 25.7% and 37.3% of their person years respectively, compared to 31.9% and 25.6% for the nation.

Technical Orientation

The eight technical organizations represent 18.2% of the organizations. These organizations employ 29.3% of the total infrastructure employees and use an average of 31.8 professionals and 9.9 staff. The average organization employs 41.7 equivalent full-time people.

Technical organizations concentrate efforts in the area of research, which accounts for 42.9% of their time, as compared to 29.6% for this activity in the nation.

Human Relations/Management Orientation

These organizations comprise 11.8% of the total employment in the

infrastructure and represent six, or 13.6%, of the organizations. Human relations/Management organizations employ an average of 14.6 professionals and 8.3 support staff, for an average total of 22.4 employees.

The organizations focus on educational activity, which represents 48.8% of their total person years, compared to 25.6% for this activity in the nation.

Management/Technical Orientation

The six Management/Technical organizations utilize 25.7% of employees in the infrastructure and represent 13.6% of the organizations. The average organization had the full-time equivalent of 48.9 employees, of which 30.5 were professional and 18.4 were staff.

The Management/Technical organizations concentrate their efforts in the area of assistance, which accounts for 50.6% of their person years, compared to 31.9% for the nation.

Human Relations/Management/Technical Orientation

These organizations involve 5.6% of the employees in the infrastructure and represent three, or 6.8%, of the organizations. The average organization employs 21.3 people, of which 12.7 are professionals and 8.7 are staff.

The organizations in this category concentrate on the education area, which accounts for 46.2% of their effort, compared to 25.6% for the nation.

To assist in the analysis of the data, the productivity organizations were classified by size (see Table 6). Fifty-two percent, or 23 organizations, were classified as small in that they had the equivalent of .5 to 10 employees. There were 15 medium-sized organizations (34%) which ranged in size from 12 to 34 employees, and there were 6 large organizations (14%), which ranged in size from 50 to 250 employees.

Small Productivity Organizations

Although they represented 52% of the productivity organizations, the 23 small organizations accounted for only 9.3% of the total numbers of employees in the productivity infrastructure. On the average they employed the full-time equivalent of 2.8 professionals and 1.8 staff, for a total size of 4.6 employees.

As can be seen from Table 6, the proportion of small organizations classified in the major orientations area is similar to the nation's distribution. The exceptions are the management orientation area, with 21.7% as opposed to 15.9%, and the management/technical orientation with 8.7% as opposed to 13.6%.

The distribution of small productivity organizations' efforts in assistance, education, publication, research, and other compared with the nation's distribution is quite different in the education category, with small organizations devoting only 16.7% of their resources to this area, as compared to 25.6% for the nation. A substantial difference also exists in the "Other" category.

Medium-Sized Productivity Organizations

The medium-sized classification represented 34% of the productivity organizations. These 15 organizations accounted for 27.9% of the total employment in the productivity infrastructure. The typical organization employed the full-time equivalent of 21.2 employees, of whom 13.9 were professionals and 7.3 were staff.

The medium-sized productivity organizations' response to major orientation areas differed considerably from the nation's distribution, with 6 organizations, or 40%, as opposed to 31.8%, concentrated in the human relations area, and 13.3%, as opposed to 6.8%, with a multiple orientation involving human relations/technical/management. Human relations/management also differed, with 13.6% of the nations' organization involved in the area compared to no medium-sized organizations.

The percent of the medium-sized productivity organizations' efforts expended on assistance, education, publications, research, and other corresponds very closely to the national distribution of effort in these categories.

Large Productivity Organizations

The six large productivity organizations represent only 13.6% of the total number of productivity organizations; however, the large productivity organizations account for 62.8% of the total employment in the productivity infrastructure. The average large productivity organization had the full-time equivalent of 119.2 employees, of whom 72.8 were professionals and 46.3 were staff.

Table 6 indicates that the distribution of major orientations for large organizations differed considerably from that of the nation. For large productivity organizations, 66.7% indicated a multiple orientation, as compared with only 34% for all productivity organizations. The technical category is the only area similar to the nation's distribution, with 16.7% of large organizations providing the service, compared to 18.2% for the nation.

The percentages of the large productivity organizations' efforts devoted to assistance, education, publications, research, and other, as one would expect, correspond very closely to the national distribution of effort on these categories.

Productivity Services Coverage

For the purpose of determining the extent of coverage of productivity services provided by the organizations, it is necessary to identify an area, the demand for productivity services, and the various services provided within that area. The question, then, of how to define the area for examination arises. For the purposes of this report, the area was defined as one of the ten Federal Regions.

Information on the demand for productivity services on either a national or regional scale is nonexistent. In the absence of such

data, the number of business establishments with between 5 and 499 employees served as a crude proxy of demand. The size group "1 to 4" employees includes establishments that did not have any paid employees in the mid-March pay period, but paid wages to at least one employee at some time during the year. This size group was eliminated, as were establishments with 500 or more employees. It is assumed that the large firms would have in-house expertise and should not require the services of the productivity organizations to the extent other, smaller firms do. However, it should be recognized that some of the productivity organizations do extensive work with larger firms.

Data for the demand proxy was obtained for 1980 from the U.S. Department of Commerce, Bureau of the Census, publication entitled, County Business Patterns - United States. Of the total paid civilian wage and salary employment, this publication accounts for 76.5%. It does not include some sectors which the productivity organizations work with, such as government, railroad, agriculture, and domestic services.

Issue: Substantial gaps exist in the national productivity infrastructure in terms of both geographical coverage and the range of productivity services provided.

A productivity service ratio for a region, the number of productivity person hours per establishment, was calculated by dividing the total number of productivity person hours available in the region by the demand proxy, that is, the number of establishments employing between 5 to 499 people.

The productivity service ratio can be used to gain insight into the extent of productivity services coverage for a region. For the United States, about one hour of productivity services are available for each establishment. Although the productivity service ratio is a crude measure, an examination of Table 8 shows a complete absence of service for one region and a very low level of service relative to the nation in other regions. Similar information at the state level is

shown in Appendix Table C-3. Care must be exercised in interpreting this data, because a number of the productivity organizations service areas beyond the state in which they are located.

In addition to the productivity service ratio as a measure of service delivery for a region, the map showing the location of the productivity organizations and data gathered during the study provide an indication of service delivery. The data is as follows:

- o Region I does not provide service in the technical area or any effort in research. Majority of effort in this region is in the area of human relations, which accounts for 85.7% of the region's effort in terms of employees. The major activity in the region is education, involving 51.4% of the effort.
- o Region II provides service in all three major classifications. Human relations/management accounts for 43.1% of the available time of productivity employees. Education is again the major activity, representing 48.1% of the effort.
- o Regions III, IV, and VI provide service in all three major classifications. In Region III, Human Relations/Management/Technical-oriented productivity organizations account for the largest effort, with 27.2% in terms of employees. The major activity is assistance, using 39.6% of the hours. Management/technical classification uses 69.1% of the effort in Region IV. The major activity is assistance, with 48.6% of the employees. Region V is heavily concentrated in human relations, which involves 86.6% of the employees. While service is provided in all the major classifications, management and technical service each accounts for only 6.7% of the employees, or 13.4% combined. Employees are allocated approximately evenly to each of the major activities. The management/technical area represents 72.1% of the effort in Region VI and assistance accounts for 39.2% of employees' available time.

Map 1

Location of Productivity Organizations
By Major Orientation

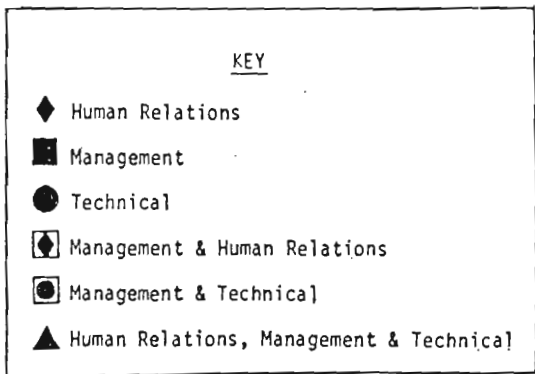
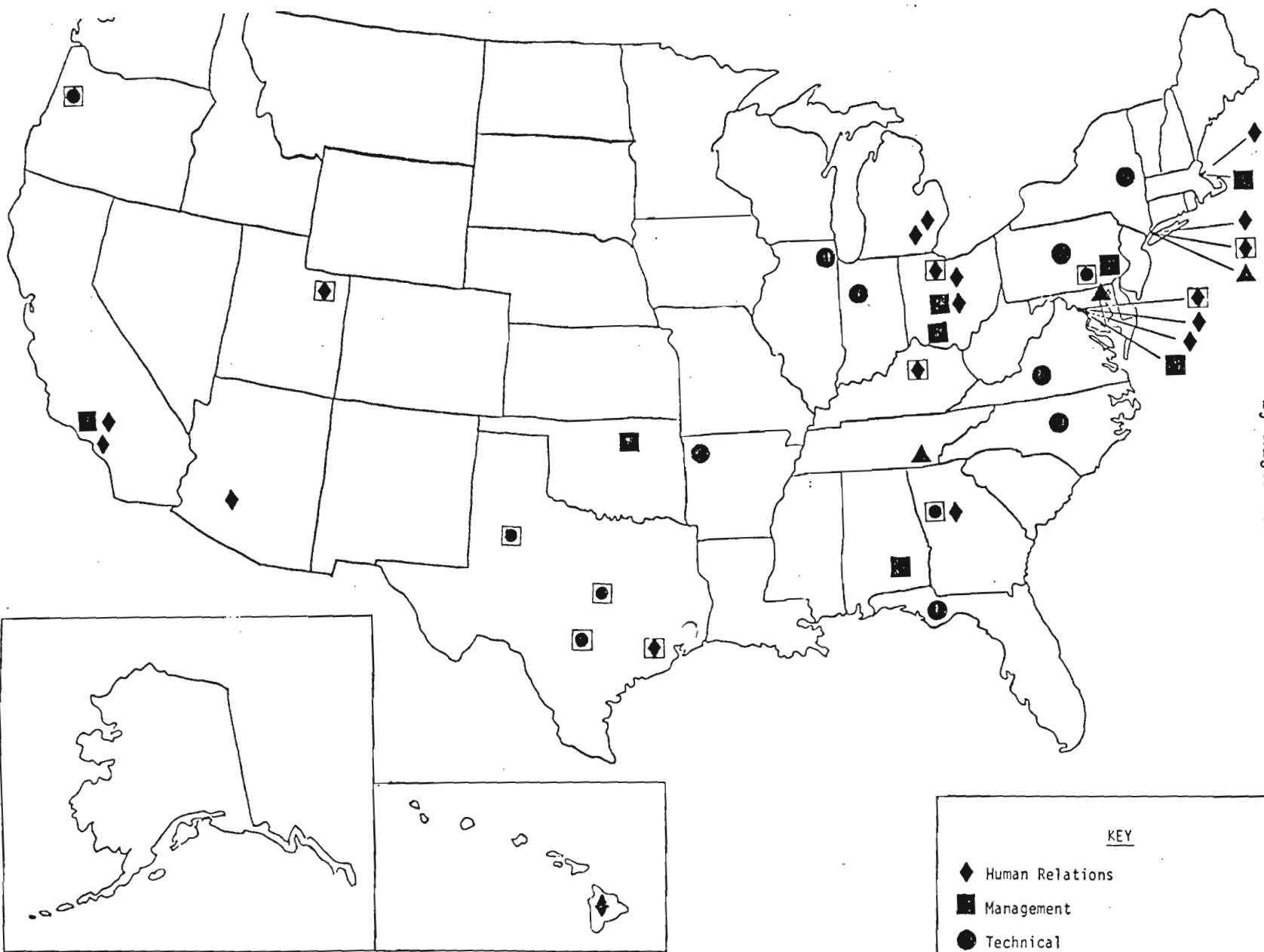
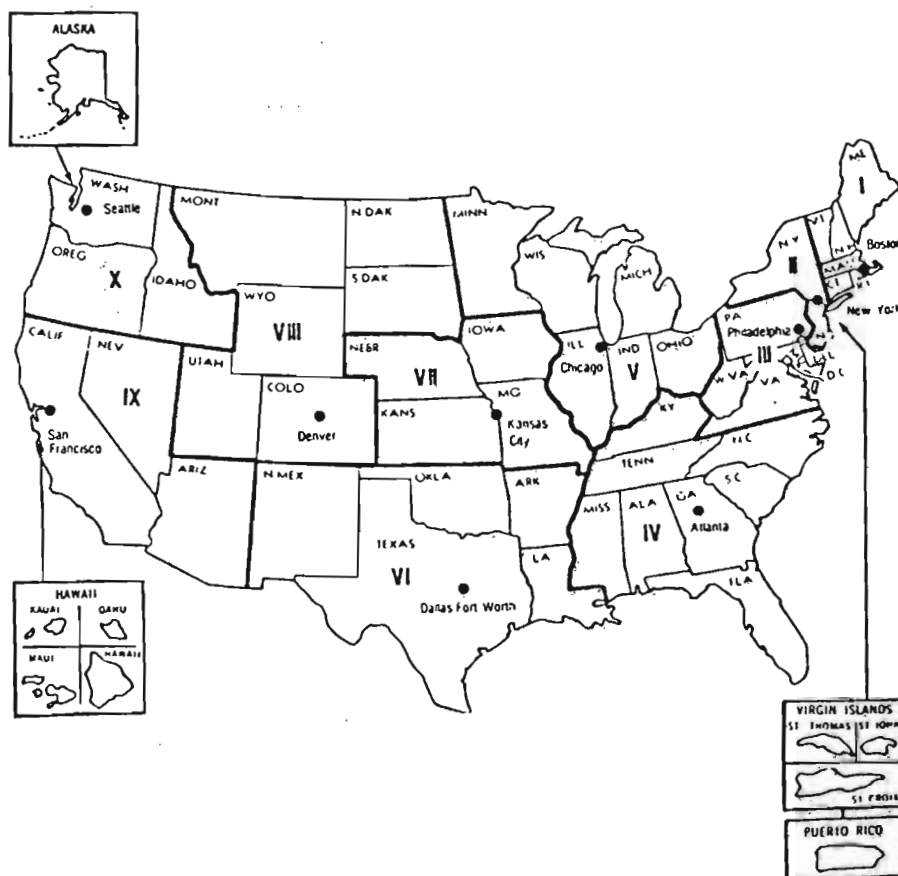


Table 8

Productivity Service Ratio by Region

Region ¹	Number of Establishments	Number of Productivity Person Hours Available	Productivity Service Ratio (Hours per establishment)
I	117,459	56,000	.477
II	217,657	268,000	1.231
III	209,090	213,500	1.021
IV	334,209	419,800	1.256
V	366,037	808,000	2.207
VI	231,383	391,000	1.690
VII	115,496	0	0
VIII	64,243	9,000	.125
IX	276,523	71,000	.257
X	80,029	8,500	.106
United States	2,012,126	2,244,800	1.116

¹The Standard Federal Regions:



- o Region VII does not have a productivity organization.
- o Region VIII does not provide service in the technical area. There is only one organization in the area of human relations/management. Efforts in this organization concentrate on the areas of assistance (40%) and education (40%).
- o Region IX does not provide service in the technical area. Human relations accounts for 66.2% of the effort and research accounts for 37.6%.
- o Region X has one productivity organization with a management/technical orientation. Assistance accounts for 44.9% of the effort. No human relations service is provided.

REPRESENTATIVE PRODUCTIVITY ORGANIZATIONS

In the preceding analysis of the productivity organizations, the general characteristics of the nation's productivity infrastructure have been examined. These parameters provide a framework in which to interpret the detailed data obtained from the personal interviews of "representative" productivity organizations.

The advisory committee selected "representative" productivity organizations and classified them a priori according to their major orientation, that is, human relations, management, and technical (see Methodology section). Table 9 shows the distribution of the "representative" productivity organizations relative to all productivity organizations for the major orientations which the organizations claimed, and indicates their size. As the table shows, though the advisory committee did not have the actual productivity organization distribution data, the characteristics of the organizations selected for interviews correspond closely to those of the universe.

Table 9

Characteristics of the Productivity Infrastructure and the Distribution of "Representative" Productivity Organizations

	Number of Productivity Organizations/ Number of Interviews			
	<u>Small</u>	<u>Medium</u>	<u>Large</u>	<u>Total</u>
Human Relations	7/2	6/1	1/0	14/3
Human Relations/Management	4/2	0/0	2/1	6/3
Management	5/2	2/0	0/0	7/2
Management/Technical	2/1	2/1	2/2	6/4
Technical	4/1	3/2	1/1	8/4
Human Relations/Management/ Technical	1/0	2/1	0/0	3/1
TOTAL	23/8	15/5	6/4	44/17

The information obtained from the in-depth interviews is presented in a narrative format and presents the opportunities and problems which face all productivity organizations similar to these "representative" ones. For each of these productivity organizations, a narrative has been prepared which categorizes responses to the interview in these major areas:

- o primary mission of organization
- o nature and work of organization
- o organizational techniques and resources
- o major strengths of organization
- o organization's most successful project
- o organizational problems and needs
- o organizational changes envisioned for the next five years
- o future productivity issues
- o ideal productivity organization

The detailed descriptions of the organizations are included in Appendix B. These descriptions should facilitate networking. As the American Productivity Center stated in its interview, "a more complete understanding of the activities of the various centers would be required to create more interaction among productivity organizations." Shown below are the classifications of the "representative" productivity organizations by major thrust or orientation and size.

	<u>Size</u>
Human Relations	
Center for Improvement of Productivity Fairfax, VA	Small
Michigan Quality of Work Life Council Troy, MI	Small
Work In America Institute Scarsdale, N.Y.	Medium

	<u>Size</u>
Human Relations/Management	
American Productivity Center Houston, TX	Large
Maryland Center for Productivity & Quality of Working Life College Park, MD	Small
Utah Center for Productivity and Quality of Working Life Logan, Utah	Small
Management	
Oklahoma Productivity Center Stillwater, OK	Small
Productivity Center Chamber of Commerce Washington, D.C.	Small
Management/Technical	
Georgia Productivity Center Atlanta, GA	Large
Oregon Productivity Center Corvallis, OK	Small
Texas Center for Productivity and Quality of Work Life Lubbock, TX	Medium
Texas Hospital Association Statewide Productivity Center Austin, TX	Large
Technical	
Manufacturing Productivity Center Chicago, IL	Large
Pennsylvania Technical Assistance Program (PENNTAP) University Park, PA	Medium
Productivity Extension Program Raleigh, N.C.	Medium
Productivity Evaluation Center Blacksburg, VA	Small

Human Relations/Management/Technical

National Center for Public Productivity
New York, NY

Medium

The following section summarizes the responses of the 17 "representative" productivity organizations interviewed, and isolates some central issues. An "issue" in this context is defined as an area of significant concern in which direct action needs to be taken to ensure improved national productivity.

Nature of Productivity Services

Broadly stated, the 17 productivity organizations interviewed provide an array of services which fall generally into three categories: management, technical, and human resources-related assistance. Some of the productivity organizations specialize in one or another aspect of these services, while others seek to provide at least certain services in each of the areas.

The productivity organizations take a variety of approaches to implementing their services once a client has contacted them. Some organizations perform diagnostics or productivity audits to identify areas in their clients' operations that would benefit from productivity improvement. Other productivity organizations -- and this is partly a function of the limited resources available to them -- work more in a problem-solving mode. Management identifies a specific area requiring improvement and the organization seeks to define ways in which that area can be improved.

In almost all instances, however, the client makes the final determination about which productivity areas are to be addressed. As one productivity organization phrased it, improvement efforts are concentrated "where the company seems most receptive to implementing the results. Approach is not to tell them something they do not want to know." Sometimes the skills of the productivity organization's staff will be significant in determining a focus, while at other times the area in which the greatest improvements can be attained is

selected as the focus. In general, the sophistication of the client's "system, awareness, and knowledge" is a key factor in determining how productivity improvement efforts will be concentrated.

The productivity organizations do not seem to have any genuinely systematic ways of identifying new technologies or management practices, though they certainly make concerted efforts to stay abreast of developments in their respective fields. The means they employ to do this include forming advisory groups for their organizations; attending productivity meetings and conferences; working with information clearinghouses; reading the significant journals, newsletters, and other types of publications in the field; meeting with industry groups; maintaining contacts with productivity specialists in the academic world; making trips to Japan; taking courses in new productivity techniques; soliciting feedback from clients; and maintaining active membership in productivity-related associations.

Virtually all the productivity organizations receive requests for productivity services they cannot provide and, obviously, what these requests and services are varies on the basis of the type of services the organizations do provide. In general, a number of productivity organizations mentioned a desire on the part of their clients for productivity information and publications which the organizations are unable to provide. Other types of services mentioned with some frequency include productivity measurement, particularly for "knowledge" workers, and basic industrial engineering assistance.

Other areas of significance in which client needs are apparently not being fully met include quality of work life concerns like compensation and gainsharing plans; hardware selection and implementation; quality control; work simplification; office automation as it affects professional workers; identifying and evaluating software packages needed for engineering, manufacturing, design, inventory, and production operations; start-up assistance; and awareness training. Fewer productivity organizations than might be expected mentioned referring clients to other organizations when they requested services

outside the areas addressed by the organization they originally contacted.

Productivity Services in the Future

Issue: Quality of work life issues and labor/management cooperation are essential to improved productivity in the future.

The productivity organizations identified a wide variety of areas in which their clients will require assistance over the next five years. One important area will be retraining and relocating workers who will be displaced either by new technologies or by irreversible declines in their industries. In relation to this, new ways of fostering cooperation between labor and management, particularly in union environments, will need to be defined. Intensified supervisor training; the fostering of work-team structures; employee involvement in participative management techniques; and gainsharing are all issues that will need to be addressed over the next five years.

Issue: Objective means of measuring productivity at the firm level and for interfirm comparisons are needed.

Productivity measurement was also identified as an important issue in the coming years. Companies will need to take a comprehensive look at the total productivity picture within their organization and will require in-house systems to measure and monitor productivity. Interfirm productivity comparisons and individual productivity audits will be important components of this effort. Other issues that were also specified as being important over the next five years include: plant design; sociotechnical assistance; technological applications using microcomputers; follow-up consultation after training courses; basic management services; office automation; robotics; alternatives

in computer software; CAD/CAM; specific "how-to" assistance focused on industry groups; and more systematic means of technology transfer.

Issue: Standard training course modules can help ensure quality in productivity services.

While most of the productivity organizations reported that they plan to modify or change the services they provide in response to both perceived client needs and a shifting productivity market, none planned any genuine structural changes in their overall approach to delivering productivity services. Most suggested that they would be refining or improving the services they currently offered; bolstering their marketing efforts; adding specific capabilities (e.g., overhead analysis); developing closer relationships with industry associations, businesses, clients, or university units; or enhancing their coordination efforts.

Most of the productivity organizations believe that standard training course modules on productivity are needed, although a significant minority holds that any such effort at standardization is premature or inappropriate. Measurement was frequently cited as an area in which training modules would be useful. Other possible topics include technological innovation; operational innovation; labor/management cooperation; and management principles related to productivity. One productivity organization suggested a "two to four hour common productivity message that could apply to most productivity programs or short courses. That way everybody would be getting a consistent message."

On the other hand one productivity organization expressed the view that "standard productivity training is negative -- forces company into a preconceived mold." Concern about standardization in the productivity field emerged as an important theme.

Virtually every productivity organization is using training packages which they either developed themselves or obtained from other

sources. Some topics these packages addressed include: work innovation; productivity measurement; management by objectives; report writing/business writing; quality circle implementation; small group problem solving; participative management; preventive maintenance; introduction to exporting for business; software design; knowledge engineering; interfirm comparison; CAD/CAM factories; union/management cooperative relations; and microprocessors.

Issue: New technologies and management practices are important for improving productivity, but transferring existing techniques will be very important as well.

The productivity organizations believe with virtual unanimity that the introduction of new technologies or improved management techniques will be very important in increasing the productivity of their clients in the future. One productivity organization describes this as seeking new ways to attain the optimal mix of human and technical factors. Several productivity organizations, however, make the important point that "firms could make significant improvements using existing, off-the-shelf technologies." This view renders technology transfer techniques a very important consideration for successful productivity improvement in the future.

The productivity organizations identified a broad range of issues as constituting opportunities for productivity organizations in the future. The major thrust of these suggestions would seem to be that while technological innovations will have the most profound impact on the work place, the human component of productivity improvement must not be overlooked.

The areas the productivity organizations cited include: quality of work; worker involvement; quality circles; small group problem solving techniques; strategic planning; awareness building; technology transfer; assisting companies with capital investment decisions; employee training and retraining; factory and office automation; software selection evaluation and measurement; robotics; interfirm compar-

ison; white-collar productivity; service sector productivity; productivity improvements for small businesses; national productivity policy; and productivity integration.

Problems Facing Productivity Organizations

Issue: Most productivity organizations have not developed sources of funding which will provide sufficient and continuous support.

Without any question, the major problem facing productivity organizations is funding. By and large, the organizations are comfortable with their staffs and capabilities, though increased funding would make improvements possible in those areas as well. Some productivity organizations also reported difficulty in defining a specific focus for their productivity activities.

One productivity organization lists the spectrum of funding problems rather concisely: "Lack of resources, always struggling, having to allocate modest funds to numerous opportunities, difficult to maintain continuity, not up to critical mass in regard to size." Another response laments a lack of money available to invest in new programs.

Issue: University-based productivity organizations have problems establishing an independent identity and establishing visibility.

The university-based productivity organizations cited difficulty in establishing visibility and an independent identity within the university structure with its many and varied missions and programs. At the same time these organizations acknowledged the advantages they enjoy in terms of credibility and availability of high quality resources as a result of their academic base. One productivity

organization noted the lack of "incentives for faculty participation" in its programs.

In terms of successfully promoting their services, the productivity organizations note a number of problems. The general problem of inadequate funding and resources affects promotional efforts, as well as every other aspect of the organizations' work. The problem the university productivity organizations noted of establishing visibility and an independent identity both on and off campus presents obvious difficulties in the matter of promoting services. The funding problem has an additional aspect as it relates to promotion. As one productivity organization put it, "We absolutely don't promote what we do because our resources are so limited that we don't want a lot of people saying we want help that we can't do anything for. We let people come to us and try to respond." Again, the number of productivity organizations "selling themselves as productivity experts" was cited as a problem in promoting productivity services.

Some additional problems impeding promotional efforts are that clients have a hard time trying to figure out exactly what productivity organizations do; organizations provide a range of services that by and large are not "crisply and visibly" packaged; it is difficult to quantify productivity results; contacts at client companies move to other firms and are replaced by new people unfamiliar with the productivity organization; and some organizations lack technical knowledge about how to promote -- "what kinds of promotional brochures, flyers, and mailings to have."

The productivity organizations reported virtually no legislative or constitutional prohibitions to implementing their program, though in other parts of the interview antitrust legislation was often cited as impeding effective productivity research. One productivity organization claimed that a particular section of the National Labor Relations Act "potentially prohibits labor-management relations." Another reported that the "moratorium of funding of new programs by federal government has led to very severe budgeting problems for the

last couple of years." Another mentioned difficulties in having the governor of their state approve their federal grant because "he didn't want to take any more federal money because it always ends up costing the state in the long run to utilize these funds." But apart from these observations, no legislative or constitutional difficulties were reported."

Issue: Competition among productivity organizations impedes the free exchange of information and inhibits profitable interaction.

Competition with other productivity organizations is cited as a major problem, and this problem has essentially two components. The first is that increased competition among productivity organizations inhibits the free exchange of information and makes it difficult to avoid duplication of efforts. It is hard to determine the most advanced knowledge in any specific area when organizations are reluctant to share results and reports on their activities. The second problem related to competition -- and one that was mentioned repeatedly -- is the claim that the productivity field is crowded with pretenders who "blur" criteria and make it difficult for funding agencies and potential clients to identify truly qualified productivity organizations and weed out fakes. This widely shared perception exists rather uncomfortably along side the organizations' desire not to standardize the productivity field because to do so would inhibit creative approaches and slow down the dynamic activity in productivity research.

Federal Role in Productivity Improvement

Issue: The federal government has not devoted sufficient resources to its productivity activities and has not sufficiently utilized the regional productivity organizations.

All 17 productivity organizations interviewed described certain areas, however circumscribed, in which the federal government could play an increased role in productivity improvement. Concern about a "government giveaway" and the establishment of a bureaucratic "large organization," which is a recurring theme in all aspects of the discussion with the productivity organizations of the federal government's proper role in productivity enhancement, persists here as well. But the organizations clearly want some level of federal government support.

It should be noted that the viewpoints expressed on the federal role in productivity improvement represent those of various productivity organizations interviewed and in some instances do not indicate awareness of current efforts by agencies such as the Department of Commerce's Office of Productivity, Technology, and Innovation.

Most generally, several productivity organizations suggested that the federal government serve as a focal point for productivity awareness and work to communicate both the severity of the productivity crisis in the U.S. and the efforts being made to alleviate that situation. In this capacity, the government should disseminate information and serve as a "clearinghouse" for data on important productivity problems.

More specifically, it was suggested that -- perhaps in the course of creating a coherent national policy on productivity, as some organizations recommended -- the federal government should institute a policy of tax credits and other types of incentives to encourage productivity improvement in industry. Some relief in the area of antitrust legislation would also make industry-wide efforts to improve productivity somewhat more feasible and would enable more accurate interfirm measurements on productivity.

One productivity organization suggested that because "the generic type of research that we need will not come from individual corporations," the federal government should undertake support for basic research in the productivity area as it has in the area of

national defense. Other suggestions included the provision of "modest grant support for consultation and training," and facilitating "labor/management cooperation." Again, the consensus seemed to be that all federal government efforts should be coordinated through the "regional productivity organizations" and should have as one of its primary goals facilitating the work of those organizations.

Asked specifically about the appropriate federal government role in the areas of technology awareness, development, and transfer; management education and assistance; and human relations education, research, and assistance, the productivity organizations generated a range of responses which represent a broad spectrum of views in each of the eight areas, but which by and large, reconfirm the more general views expressed during the interview on questions of the federal productivity role.

Most respondents seemed to perceive a valid federal role in the area of technology awareness. This corresponds well with the view of the federal government as an information clearinghouse in the productivity area. One productivity organization suggests that the federal government "should increase cooperative research for some of the more exotic industries that are coming." Another recommends that while the government should do little for large firms in this area, its "role should be significant for smaller firms." This respondent also believes that the government should have responsibility for generating awareness of the impacts of technology.

As for technology development, the general view seems to be that the federal government should take the lead in areas related to the national interest, such as defense. In other areas, its role should be secondary. Some appropriate activities that were put forward include funding basic research in high risk areas; funding demonstration projects on, for example, a completely automated factory; funding cooperative research projects; and easing concern about antitrust regulations.

In the area of technology transfer, appropriate federal activities would seem to be providing seed money; disseminating

information about technologies the government itself has developed, for example in the federal laboratory consortium; transferring knowledge to the productivity organizations and allowing the existing delivery systems to effect further transfer; and assisting smaller firms in the manner of the Agricultural Extension Service.

As for efforts in management education, the general view seems to be that the federal government should play a secondary role to the private sector. The "federal government has no competence here" one respondent asserted. One valid role for the federal government would seem to be supporting the management education efforts of institutions of higher education. One respondent suggested that the federal government provide some assistance in this area for small businesses. Another response suggested that in providing management education, the "private sector should support university programs and be involved in a participative role." Some federal funding might be appropriate within that framework.

The overriding view in the area of management assistance is that the federal role should be secondary to that of the private sector. Suggestions for possible federal involvement in this area include support of university programs; private audits; and funding for existing productivity organizations working in this field. One response suggested the following: "Federal role could be extension role. Labor should be represented in any activity. Private sector should share information."

In terms of efforts in the areas of human relations education, a variety of activities for the federal government were suggested. One productivity organization suggested funding "cost-free conferences, except for travel expenses." Other suggestions included funding basic research in the social sciences; funding activities through the U.S. Department of Labor; and improving management skills in small businesses. One respondent suggested that the "federal government could participate in (its) role as the social conscience," while another recommended that the federal role "be even-handed with respect to labor and management. Role should be to encourage and stimulate, but not regulate participative management."

There seems to be general agreement that the federal government can play a valuable role in the area of human relations research. The prevailing view is that the appropriate federal role would be in funding and providing incentives for the following types of activity: case studies; research in the behavioral sciences; generic research of a technical nature; and cooperative research involving interaction between researchers and potential users.

In the area of human relations assistance, the consensus appears to be that the federal government can play a role by providing seed money funding; assisting industry in retraining and relocating workers; funding activities which would help develop small business team building and industry/university interaction; funding extension activities; disseminating information; and publicizing successes.

Apart from the often-expressed concern about federal government involvement in productivity, at least two responses suggested that the federal government must serve as a "catalyst" or "change element" in the productivity arena. With the support of this catalytic action, productivity organizations believe their goals will be much easier to accomplish. "You can't expect major improvement in productivity to come from the bottom up," one organization asserted. "It takes too long. We need to have some government initiative and cooperation with all sectors of the economy."

National Productivity Program Purposes

Issue: A national program is needed to fund productivity-oriented research.

Twelve of the 17 productivity organizations interviewed expressed a view that a national program is needed to fund further research in productivity. The other five responses (four no, one undecided) all took a moderate stance, expressing concern about what a national program might become and suggesting possible ways in which such a program might prove useful.

For the most part, this concern among productivity organizations centered on a fear that such a program would become embedded in the federal bureaucracy -- "no internal federal programs" insisted one respondent who is in favor of a national program -- and would support work that is too theoretical and basic, not sufficiently applied.

The suggested purposes of the program are to stimulate modest research efforts through seed money provided to existing, established productivity organizations; to help establish standards for organizations and methods; to help define an appropriate national productivity policy; to fund demonstration projects; to increase productivity awareness in the country; and to serve as a means of effective information gathering for productivity data. Individual productivity organizations also made specific suggestions for topics in their area of specialization that could be researched, and much of this information is included in the descriptions of the organizations.

Issue: Important factors impede interaction among productivity organizations.

The primary challenge of increasing interaction among productivity organizations is convincing them that "there is nothing to lose through interaction." Many productivity organizations made specific recommendations of a less complex nature that would spur interaction. Funding for an increased number of "cost-free" meetings rotated by region and possibly for an electronic mail system was one idea that was raised.

However, a desire among the productivity organizations to protect their own interests -- often expressed as the perception that this is what other productivity organizations are doing -- may impede increased interaction.

Concern in this area touches on a number of significant points. One is the absence of objective standards against which productivity organizations could be measured. One response complains that "There are certain skills that your organization has that other organizations

. . . don't have, and yet if you put out an RFP, those other organizations will unquestionably respond to the RFP and state that they have as much expertise as you do."

Another concern is the anxiety among productivity organizations that they will have potential business swept out from under them if they share their methods and information too easily. One response recommended dividing the nation into regions, each under the aegis of specific productivity organizations, to allay this fear. Whatever methods of information exchange and communication are devised, the productivity organizations will have to be assured that they will not harm themselves through open interaction with other productivity organizations.

Nine of the productivity organizations expressed a belief that their local status would be enhanced through national affiliation, while five responded that such an affiliation would be no special help to them. The advantages a national affiliation would offer include increased visibility and recognition; combined resources; a sounding board for new ideas; improved funding prospects; and a means by which performance standards could be defined and productivity awareness raised.

One productivity organization that believed national affiliation would hold no advantages attributed this view to the fact that "people want the job done locally and with local assistance." Other organizations believed they already held a national reputation, or that because their forum of activity and funding were almost exclusively local, a national affiliation would not really be relevant to the issue of their stature.

Issue: A national productivity office would be desirable but it must not become a bureaucracy.

Fourteen of the productivity organizations interviewed agreed there was a need for a national productivity office. However, as with the earlier question about "a national program to fund further

research in productivity," the responses on this issue really constituted a discussion of the problems and possibilities such a productivity organization would entail, rather than an "up or down" vote on whether such a productivity organization should exist. A number of organizations that supported the notion of a national organization spent a good deal of time detailing what they do not want the organization to be.

The primary functions a national productivity organization could perform include providing financial resources; helping existing productivity organizations to realize their goals; giving a government stamp of approval to productivity efforts; monitoring performance; serving as a clearinghouse for productivity information; and providing a central focus for the "tremendous opportunity to improve productivity."

Concern about the national productivity organization coheres on a few significant issues. One human resources-related organization expressed the view that "the public gets lost in the private" when the focus on productivity is national in scope. While one productivity organization believed that the regional organizations need "a strong central unit to guide" them, another said "The productivity organizations do not need another organization to 'coordinate' them." A fear that the productivity organization would simply become another bureaucracy was also expressed: "Keep it out of Washington and the bureaucrats." The prevailing view seemed to be that some sort of national productivity organization was necessary; that it should be funded by the federal government and made part of an existing agency or department; and that its function should be to facilitate the activities of the regional productivity organizations and not to grow into a large productivity organization itself.

This perception is borne out by the responses to the specific question about the role of the national productivity office. In using terms like "hub," "link," "flagpole," "facilitator," "forum," and "clearinghouse," the productivity organizations are obviously making

the point that the national productivity office should serve as a means of unifying the widely disparate activities of productivity organizations, exchanging and testing information, and drawing attention to productivity issues.

Suggestions were made that a number of established productivity organizations should be identified and funded by the national productivity office. The productivity organization can also serve as a mechanism for industry-wide studies that would not be hampered by antitrust legislation. In its role of disseminating information and sponsoring conferences and meetings, the organization should "provide leadership without bureaucracy." The organization might also prove useful in providing national productivity policy guidance.

Issue: Little current support exists among the productivity organizations for instituting an accreditation procedure for their organizations.

Most of the productivity organizations do not see a need for national accreditation of productivity organizations. The reason for this is that the organizations fear the establishment of a general standard that would not be appropriate to the specific types of productivity work that they do. From this standpoint accreditation is "not feasible" or is "impractical." There seems to be a sense -- reflected by such responses as "strongly against," "nonsense," "no - no way" -- that the productivity field is healthily varied and that accreditation under such circumstances would be extremely inappropriate. As one productivity organization put it, "Accreditation assumes 'stability,' and there is no stability now in the productivity area."

However, this apprehension is coupled with a sense that some effort to standardize the productivity field might be appropriate. This sense derives from the views expressed regarding a national productivity program and a national productivity organization. The feeling seems to be that because the productivity field is wide open, it is vulnerable to charlatans who crowd the field and make it

difficult for outsiders, potential clients, funding organizations, and so on to discriminate between legitimate productivity organizations and opportunistic ones. One productivity organization mentions that certain "productivity organizations have not been identified as being facetious or false" and another alludes to "unqualified individuals starting and stopping productivity organizations." Obviously, a clearly defined process of peer recognition and accreditation would weed out productivity organizations with no real qualifications, even if it does entail the possibility of too narrow a standard.

Apart from rather intangible qualities like "commitment," one productivity organization suggested some criteria for accreditation: "What are their information capabilities? What kind of library do they have available that is dedicated to productivity? How able are they to respond to a request for assistance?" Another productivity organization allows that while "formal accreditation is currently impractical," productivity organizations could "become recognized as sources of methodology which have credibility -- thus achieving at least a part of the quality objective."

Productivity Services Users

The "representative" productivity organizations provided the names of users of their services so that the perspective of the users could be included in terms of the value of the services and future needs.

Of the 17 productivity organizations visited, only seven directors provided names of productivity services users. Even though the interviewers explained that the information obtained would be confidential and that any published information would be free of specific data, five of the directors declined participation due to their promises and/or legal guarantees of confidentiality with their clients. One of the remaining organizations had no client/project relationships, and another was primarily publications-oriented. The

other three organizations gave no reason for not responding to the request.

The seven productivity organizations that responded provided a total of 20 users. Seventeen of the users were contacted by telephone and provided verbal evaluations. Two users could not be reached (one did not answer and another was too busy to respond) after numerous attempts. The remaining user felt that an evaluation was premature at this time.

The productivity organizations are not operating under a particular program, so their work is quite diverse, ranging from brief publications and one-day courses to multi-year research efforts. A detailed study of the work, which would have called for personal investigation, observation, and in-depth interviews, was not performed, because an evaluation of specific technical and/or economic effects is beyond the scope of this project.

The following list of the 17 cases involved illustrates the diversity of both users and services rendered:

<u>User Description</u>	<u>Productivity Service Description</u>
Aluminum extruder	Storage rack redesign and equipment layout assistance
Public school system	Quality circle implementation
Telecommunications equipment manufacturer	Machine idle time and scrap reduction assistance
Electric utility	Quality circle implementation and maintenance
Furniture manufacturer	Materials handling and warehousing improvement; energy conservation audit; safety and health consultation
State agencies	Quality circle training
Food processor	Productivity measurement

User DescriptionProductivity Service Description

Automotive component manufacturer	Operations analysis and productivity measurement
Electric utility	White collar quality circle implementation
Electrical instrument manufacturer	Quality control assistance through implementation of a real-time shop floor data base
Automotive equipment supplier	Employee involvement programs
Apparel manufacturer	Computer hardware and software selection assistance
Food processors	Productivity measurement instruction
Municipal government	Labor/management committee development
Construction firm	Quality circle implementation
Electric/gas utility	Productivity measurement of a marketing operation
Computer manufacturer	Computer component reliability study

The services listed above were evaluated in the form of free-expression responses from users through user evaluation forms. Taken from the telephone interviews, the following excerpts illustrate the general tone of responses to the primary question: Do activities such as the project conducted for you provide a valuable service? (Why, why not, comments).

Absolutely -- before we began using this service we couldn't see the forest for the trees. (Manager)

Yes -- the services we have received were excellent, and they were free. I can say nothing but great things about the work. (Director of Staff Development)

The work was pretty much a success and was certainly appreciated.
(Manufacturing Engineer)

Yes -- we have no one on our staff dedicated to full-time productivity matters and no one with formal training in that area. The productivity organization has turned out to be very flexible. The staff are easy going and very understanding. They are close to us location-wise, which means that they can be here in thirty minutes if necessary. The only problem is that their (the organization's) staff seems to be overextended -- we have to get on a list. (Administrative Manager)

These activities most certainly provide a valuable service - they have been of tremendous help to us. (General Manager)

An excellent service -- we are very happy with the work. We have a small staff and there is no way that we could have conducted a project of this magnitude ourselves. (Personnel Director)

Absolutely - (the organization) is a first class institution - nothing finer in this country. Many productivity organizations can come in and diagnose, but this one came in and actually helped. Very few productivity organizations will take the time to understand your industry before trying to help. (Director of Industrial Relations)

Our project, which took place several years ago, was successful. The productivity organization has changed significantly since then, though, so I don't really know how our success will relate to the situation now. (Director of Productivity Programs)

Yes -- we are very pleased with the work. All of our quality circles have been successful. (Vice President)

Yes -- this was an economical way to acquire some working expertise on a project. (Manager of Manufacturing Planning)

The work has been extremely good -- the person that runs the productivity organization is very sharp and has been very helpful. (Vice President)

Yes -- in fact, as a result of this assistance we are submitting to our corporate headquarters a proposal to purchase the suggested equipment. (Director of Manufacturing)

I cannot tell you how excited I am over what has been accomplished over the last two years as a result of our working with the productivity organization. . . (Executive Vice President)

Yes -- the value of this service is immeasurable. The productivity organization can provide the direction that an organization needs. (Director of Personnel)

Very valuable. (Engineer)

Unquestionably -- we have used the productivity organization for several projects. (Vice President for Marketing)

An overwhelming yes -- we would like to see a greater "push" of academia into industry. (Manager - Quality Engineering)

The reactions cannot be considered conclusive, of course, due to the very limited number of respondents and to the selection of users by the productivity organizations themselves. However, participants in the telephone interviews expressed quite clearly their satisfaction with the services received.

The other main question in the telephone interview was: "What productivity services are needed by your organization?" Ten of the users provided one or more areas of interest. The remaining seven users could not think of particular needs, indicated "none at this time," or for other reasons did not provide needs for use in the study. Since the needs were collected verbally, many probably reflect initial thoughts rather than the more considered responses that might have resulted from a guided interview and thorough discussion.

Since the responses were so limited in number, they are presented here in "shopping list" form. It is interesting that only one area, "productivity measurement," was listed more than once (and this one was listed by only 2 of the 10 users).

Technical	Materials handling
	Materials control/management
	Manufacturing data base systems
	Microprocessor applications
	General methods for improvement (technical)
	Personal computer instruction for productivity measurement at desk or shop floor level
Management	Productivity measurement
	Productivity management
	Overhead burden measurement
	Industry comparisons
	Management guidelines and new "ways of thinking"
	Productivity audits (employee diagnostics)
Human Relations	White collar productivity (all aspects)
	Management/union cooperation
	Work specifications and standards (white collar)
	Gainsharing
	"How-tos" of introducing technology to employees
	Counseling for new people just entering management
	Just about everything

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EMERGING TRENDS

The productivity organization's role in stimulating the nation's productivity will depend on the emerging trends which will affect the work place. These trends include the changing composition of the population as well as new technologies and management techniques. These factors, some of which are obvious and others barely discernible, will help define the future strategic opportunities for productivity organizations.

The characterization of the productivity organizations provided a profile of the resources and capabilities which now exist. In a very general manner, then, a comparison of the productivity organization infrastructure and the individual organization's aspirations with a discussion on emerging trends and their impact on the work place will provide insight into the gaps between current practices and the future demand for productivity services.

Current trends in the way we are combining our various resources are described. The examination of emerging trends places our current situation in historical perspective and speculates on how current trends will fare in the future and what their likely impacts will be.

This discussion does not seek to quantify current or future productivity trends, but it does show how productivity can be enhanced in a relative sense. The section focuses on areas which are most amenable to productivity organization involvement, given the current structure of productivity organizations. As can be seen in Tables 6 and 7, productivity organizations tend to be small and somewhat more involved in human relations and management, rather than technical, issues, and they perform their functions more by direct assistance research and education than through publications. The specific roles for productivity organizations, however, cover a wide spectrum, and future opportunities broaden the scope of their involvement even further. For this reason, trends will be addressed in a large number of areas.

The emphasis will be on total productivity, which encompasses both the human and technological environments. This section will also explore how these inputs are combined, which, in turn, is influenced by the economic environment. The initial discussion, then, describes the overall economic environment, providing a historical perspective as well as describing our present situation and how present trends will likely affect our resource base. Following this will be a discussion of the work place and how emerging trends in technology and management are changing it.

The Changing Economy

The dawning of the Industrial Revolution found the United States in a unique position to make the fullest possible use of the technologies emerging at that time. Our natural resources were abundant and untapped; our institutions were newly formed and somewhat free-wheeling; our labor force was relatively scarce, promoting capital-intensity; and the pioneering spirit of our population provided a fertile ground for innovation. Still, most of our population was dedicated to agriculture and, because of the vast distances between markets, a transportation system was developed which later assisted in our industrial development.

For some time, agriculture dominated employment opportunities. In 1840, about 70% of the labor force was employed in agriculture, but even at that time a downward trend was beginning to assert itself. By 1880, the percentage was down to 50% and continued to decline dramatically to its present level of about 3%, where it has remained for a decade.^{1/}

Agricultural production, however, continued to grow. This was made possible by the increasing mechanization of agriculture and the

^{1/} Historical Statistics of the United States: Colonial Times to 1957, U.S. Department of Commerce, Bureau of the Census, Washington, D.C., 1960, and Statistical Abstract of the United States, U.S. Department of Commerce, Bureau of the Census, Washington, D.C., 1981.

development of highly productive and disease-resistant strains of plants, along with new farming methods. Fortunately, the increased agricultural mechanization coincided with increased employment opportunities in the manufacturing sector -- which was also becoming increasingly mechanized along mass production lines. Unfortunately, an antipathy between management and labor also developed. The two groups developed a somewhat adversarial stance, labor unions vs. management, which persists into the present.

Recently, the service sector has increased its percentage of employment while manufacturing has declined. Manufacturing employment has decreased from about 38% in 1920 to 22% in 1980, while service sector employment has increased from 53% to almost 71% during the same period. Another statistic which emphasizes this trend is the estimate that almost 90% of the new jobs created between 1969 and 1976 were in the service sector. Growth has not been homogeneous across all areas of the service sector, as Table 10 shows. The most dramatic increase has been in services supplied directly to the consumer, where the percentage of employment has increased from 8.5% to 19.5% between 1920 and 1980. Government employment has also seen large increases, as has wholesale and retail trade, while transportation and utilities have declined. Areas dealing with information have seen the largest growth.

The smoothness with which our economic system has adjusted to these dramatic shifts in employment opportunities is rather remarkable. But these transitions have not been perfect. The most recent shift towards the service sector has seen the basic unemployment rate begin an upward trend. In each economic cycle, the unemployment rate has risen to a slightly higher level, with recovery never quite achieving the low unemployment of the previous cycle. This has caused, for example, the definition of the "full employment" level of unemployment to rise from 2% in the 1950s to its present level of 5%-6%.

The question of how these trends will continue into the future is partly economic and partly political. Recent trends have favored a

Table 10
Percentage of Employment By Occupation

	<u>1920</u>	<u>1950</u>	<u>1980</u>
<u>Goods-Related Industries</u>			
Mining and Construction	7.7	7.2	6.3
Manufacturing	38.9	33.5	22.9
Subtotal	46.6	40.7	29.2
<u>Service-Related Industries</u>			
Government	9.6	13.5	17.5
Services	7.9	11.3	19.4
Finance Insurance and Real Estate	4.1	4.1	5.6
Wholesale and Retail Trade	17.1	21.6	27.6
Transportation and Public Utilities	14.8	8.9	5.7
Subtotal	53.4	59.3	70.8

Source: Historical Statistics of the United States: Colonial Times to 1957, U.S. Department of Commerce, Bureau of the Census, Washington, D.C., 1960, and Statistical Abstract of the United States, U.S. Department of Commerce, Bureau of the Census, Washington, D.C., 1981.

reduction in the growth of the government sector. This would imply that the percentage of labor employed by this portion of the service sector would not continue its historical trend and will level out. The commercial sector is also undergoing changes which indicate that its proportion of employment will likely level out with a restructuring of employment opportunities. Following the exhaustion of the dramatic economies of scale in the public utilities industries, employment will likely not continue its proportionate decline, but

will also level off. Manufacturing employment, having previously seen large proportionate declines, is now at a level where further reduction, though likely, will certainly be less dramatic. Again, however, there will likely be a restructuring of the kinds of employment opportunities.

The one area where growth is more certain is the sector providing direct services to the consumer, though some components of this sector will not grow and there will be a restructuring of the types of employment opportunities throughout. Educational services, for example, will not be growing, but it will be changing. Underlying these trends is a continuing growth in the base level of unemployment. This trend, however, will be ameliorated by the effects of the decreased birth rate of the post-baby-boom population.

One of the many reasons for the growth in the service sector relative to manufacturing is the service sector's lower capital-intensity. Savings and investment rates in the U.S. have been on the order of 3%-7% over the past decade, whereas our major trading partners, e.g., Japan and West Germany, have savings and investment rates in the range of 15%-20% of GNP. The continuance of this trend in the U.S. portends some difficulty in increasing the capital-intensity of the service sector to take full advantage of the productivity enhancement opportunities embodied in the technologies.

Issue: As the proportion of women and minorities in the work force increase in the future, responsiveness to special needs and nondiscriminatory policies become increasingly important.

The impact of the bulge in the labor force represented by the baby boom period has been stretched out somewhat by the higher educational level attained by the group. Simultaneously, there has been increased participation rates by women. In the future, therefore, two forces will be moving in opposite directions. Lower birth rates are

reducing the rate of growth of the labor force, while higher participation rates, particularly by women, are increasing it. How these two movements will balance out is difficult to assess, but women are likely to represent an increasing proportion of the labor force. It has been estimated that women and minorities will represent about 75% of the increase in the labor force through the 1980s.^{2/} Any discriminatory hiring or promotion practices, therefore, would reduce the contribution this large segment of the labor force has to offer our economic system.

Another important trend in the labor force has been the increasing level of educational attainment. In 1960, about 50% of the labor force had less than four years of high school. It has been estimated that by 1990, this percentage will be less than 20%.^{3/} In the age group from 25-29, the percentage graduating from high school has increased even more dramatically, moving from about 39% in 1940 to over 80% in 1980. The percentage graduating from college has also increased for this age group, moving from about 4% in 1940 to about 22% in 1980.^{4/}

A disturbing aspect of the labor force educational level is the increased functional illiteracy of high school graduates. The response to this has been an increased emphasis on basic education and the use of exit exams, requiring some minimum level of functional literacy for graduation. For this reason, and others discussed in a later section, the future educational composition of the labor force will likely embody a higher emphasis on basic skills at the primary and secondary level and a higher concentration on quality, rather than quantity at higher levels.

^{2/} "Forging New Relationships Among Business, Labor and Government: The Challenge of the 80s," John T. Dunlop, White House Conference on Productivity, 1983.

^{3/} "Forging New Relationships Among Business, Labor and Government: The Challenge of the 80s," John T. Dunlop, White House Conference on Productivity, 1983.

^{4/} "The Mechanization of Work," Eli Ginzberg, Scientific American, Vol. 247, Number 3, New York, N.Y., September 1982.

Probably the most striking development in the structure of markets of recent years is the increase of international competition. For many years, U.S. domestic markets enjoyed a measure of geographical protection, especially in manufacturing. During the last decade, however, greater increases in the growth of productivity achieved by our trading partners have enabled them to attain a level of competitiveness which domestic producers are having difficulty meeting. Barring the unlikely event of a new wave of protectionism, this internationalization of markets can be expected to increase.

Another trend in markets is the increasing size of service organizations. Retailing and fast-food service chains are two dramatic examples of the agglomeration trend. As it becomes more important to reduce overhead expenses by taking advantage of economies of scale in administration embodied in new technologies, this trend will be reinforced.

The Work Place

The nation's work place, as always, is changing. Since the industrial revolution, those changes have often been primarily quantitative. The spur of international competition and new technological capabilities are now changing the work place in qualitative ways as well, and several predominant themes emerge.

The most pervasive is the role information-related issues are playing in changing the nation's work places. The enormous powers of the computer are opening up information collection/storage/retrieval/analysis applications not previously possible. This is changing the skill-composition of the work force, as well as the basic decision making structure of organizations.

Another theme is the movement from perceiving work tasks as small, individual entities to perceiving the structure as a system of interrelated activities. Related to both of these are the forces which are centralizing some aspects of the work place and decentralizing others in relation to present practices.

Americans are working in a large number of places and perform many differing functions. Because of the complexity of the interactions among types of work and the similarities in how these types of work are affected by particular technologies, the organization of the following discussion was not easy to derive. To be complete without being redundant poses a significant challenge.

In the course of the analysis, three work place designations suggested themselves. They are:

- o manufacturing
- o office
- o educational

These divisions were assigned on the basis of several considerations. Some work places were not included because they do not seem to offer significant opportunities for productivity organization involvement. An example of this is mining, where even though productivity has declined, the reason for the decline, such as less-rich ores or safety considerations, are not areas in which existing productivity organizations have extensive capabilities. Other areas, such as pharmaceuticals, agriculture, and forestry will undoubtedly be changed by bioengineering technologies but do not offer significant near-term opportunities for productivity enhancement. Commercial activities, including wholesale/retail trade, and finance, insurance and real estate, could, arguably, have been placed in a separate category, but they are discussed under the "office work" division because of the similar ways in which their technological and human environments are changing.

The health work place is not covered separately, although it has a large amount of resources devoted to it and its uniqueness could justify a separate discussion on the impact of emerging trends such as the changing age composition of the population.

Manufacturing Work Place

Much has been written about the increased mechanization of the manufacturing sector, especially in the use of robotics made possible by high-tech, low-cost computer applications, as exemplified by the Japanese. The opportunities for cost reduction are not, however, quite as dramatic as many believe. Currently, direct labor accounts for only 10%-25% of the cost of manufacturing.^{5/} Reducing direct labor costs by a hefty 20%, therefore, would reduce total costs by a negligible 2%-5%. This is not to say, however, that increased mechanization does not have great value. Rather the value is along other dimensions, particularly quality, flexibility, and cost reductions in areas needed to support manufacturing activities. Of equal, if not greater importance, are innovations in management of both high-tech capital and the labor to operate it.

Technology

On the technological side, five major areas for innovation and productivity enhancement have been identified which will have an impact on the manufacturing work place:^{6/}

1. Design,
2. Group technology,
3. Manufacturing resource planning and control,
4. Materials handling, and
5. Manufacturing process machines.

1. Design. Computer-aided design (CAD) enables the designer to use an electronic scratch pad with basic shapes stored in memory. These basic shapes can be scaled up or down and combined with others to complete a design of any shape or function. Computer simulation

^{5/} "The Mechanization of Design and Manufacturing," Thomas G. Gunn, Scientific American, Vol. 247, Number 3, New York, N.Y., September 1982.

^{6/} "The Mechanization of Design and Manufacturing," Thomas G. Gunn, Scientific American, Vol. 247, Number 3, New York, N.Y., September 1982.

can then be applied to the design so that, given material specification, the performance of the design can be tested.

When a design has been perfected, a plotter can reproduce a set of plans for the design from any perspective and provide cross-sections where needed. The design can then be stored so that should a similar part be required in the future, it can be called back up for any modification. A further step now being taken in some manufacturing environments (particularly the military hardware related industries) is to couple the CAD directly to the machine room. This enables the computer to specify and control machine tools more quickly, completely and accurately than by manual control. It also enables slight variations from one part to the next to be incorporated automatically, thus reducing downtime on the machine.

Another important feature is the ability to send a design, with computer link-ups, to other facilities over telephone lines quickly at the same level of quality as the original. The use of CAD technology enabled GM, for example, to reduce the time required to develop a new model from 24 to 14 months.^{7/}

At present, such link-ups between design computers and machine room operations have been limited due to the single purpose nature of most machine tools. A likely avenue for future innovation is the expansion of machine tool functions to enable a wider spectrum of tasks to be linked up. Of more importance to the immediate future, however, is the wider penetration of CAD technologies into the manufacturing sector, with its attendant increases in productivity.

The job skills required to operate these systems, however, are very different from those required in the past. No draftsmen are required, for example, and the machine operator's skill must include a higher knowledge of machine operation and maintenance, but does not require the same level of manual dexterity or practice. Both the machine operator and the designer would need at least a working knowledge of computer capabilities.

^{7/} "The Mechanization of Design and Manufacturing," op.cit.

2. Group Technology. This term refers to a constructed hierarchy of manufacturing operations which coordinate several steps in the production process. It has been made possible by the wide availability of mini- and microcomputers. An individual machine would contain a microcomputer to control its movements and "report" its activities to the minicomputer controlling that particular step -- which may include other single-purpose machines. The mini would then report to a larger computer which controls, perhaps, several steps in the production process.

The advantage of this set-up is the ease with which common decisions can be programmed into the system, such as the color of paint for cars on an assembly line or the installation of specific options. Sensors can verify code numbers for specific cars as they move through the production steps with their progress recorded electronically and available for monitoring at all times. This kind of flexibility can increase the range of options offered the consumer while decreasing both the time, cost, and possibility for error in fulfilling the order.

3. Resource Planning and Control. The basic idea of manufacturing resource planning and control is that the scheduling of labor, materials, machine time, and other resource elements can be estimated by extrapolating backward from the delivery date. The advantage of this type of system is that it reduces downtime on machines and allows inventory control consistent with production. The greatest advantages are found in manufacturing processes where large numbers of relatively small batches are produced. Where such systems are installed, inventory reductions of up to a third are common. An extreme case of the application of this philosophy is the KANBAN system of Toyota. In this system, there is virtually no inventory. Suppliers are provided with schedules for delivery which coincide with usage requirements with no provision for waste or spoilage.

4. Materials Handling. Probably the most significant development in materials handling in the manufacturing sector has been the widespread adoption of containerization. The advantages of containerization are primarily in the greatly reduced cost of changing the mode of travel as the cargo moves from shipper to customer. The somewhat standardized containers offer a compact cargo on ships which can be easily loaded onto rail cars, or, after being fitted with wheels, can be tractored. Because the containers are sealed, they also offer control and audit advantages. Code numbers on the containers can be used to retrieve a detailed inventory of its contents, shipper, destination, route, schedule, and any point along its route. This also reduces the possibility for error, thereby increasing the reliability of the systems and enabling a tighter control on inventory.

A thornier problem in materials handling exists within the plant. As yet, sensors and manipulators on machines have extremely limited abilities to deal with the variety of orientations, shapes, and sizes of component parts. At present, automated inventory storage and retrieval systems are feasible only for highly standardized parts of simple configuration and limited orientation.

Indications are, however, that this deficiency in materials handling machines may soon be rectified. The June 1983 issue of ROBOTICS TODAY is devoted to presenting new developments in vision and tactile sensing technologies. Several approaches are described which, when perfected, promise to provide materials handling capabilities to machines which rival the capabilities of human operators on repetitive, assembly line-type operations.

5. Process Machines. Much has already been said about the programmable control of process machines through group technology and of the increased flexibility and reliability achieved thereby. The machines themselves are also undergoing changes to take full advantage of these technologies. In the past, a machine generally addressed a

single purpose; it drilled holes, for example, attached bolts, or painted.

With the advent of computer control technologies, the functions of machines are expanding. This is particularly evident in the production of so-called "industrial robots." The most common form of these robots is an arm which can move in many directions simultaneously or in sequence. The end of the arm can be fitted with a large number of tools and "taught" its tasks either by moving the arm through its motion -- which it will then duplicate -- or by programming signals from a control computer. It can also be equipped with sensors, for example, torque, gripping force, and visual field. It is presently limited in its ability to pick out parts from a bin where parts have a variety of orientation.

These developments presage a restructuring of the labor required to use this technology in a pattern which is often repeated in other work places. The effects of the restructuring outweigh any effects on the actual numbers of people employed, though they can be expected to decrease. At the present level of development, these technologies would require an increased skill level in the machine operators, where knowledge of computer control techniques, quality control of production and machine maintenance are critical, and a reduction in the skill level required for other support tasks, such as maintaining proper orientation of feed parts. In other words, the skill levels would become more polarized. The management implication of these developments are discussed in the following section.

Issue: The new technologies lack adequate standardization in operating systems and communications.

Issue: The new technologies tend to polarize worker skills into high and low categories.

All five areas of manufacturing technology that were discussed share common characteristics. First, there are intermediate and long-

term implications for both the quantity and skill composition of the labor force required. In the intermediate term, higher-skilled and lower-skilled labor are required at lower levels per unit of output than under present technologies. In the long term, a larger reduction to the lower-skilled labor requirements could also be expected. Another common feature is the increased interdependency of the various functions which require an increased information flow. An impediment to the realization of this information flow is a lack of standardization in the hardware and software used to control the equipment at various stages of the production process. A systems approach to the implementation of these technologies is, therefore, crucial to the full realization of their potential.

As these technologies are perfected and implemented, the classical distinction between continuous processing and batch processing will be diminishing. With modern technologies, the production of widgets will approach the continuity found in, for example, petrochemical processing, with the attendant high capital-intensity and low employment per unit of output.

An impediment to the implementation of these technologies is the historically low savings rate in the nation, as discussed previously. The implication of this is that wholesale modernization of our basic plants and equipment are not likely to take place rapidly. It also underlines the importance of making correct choices in the investments which are made. To this end, independent evaluations of alternative technologies by productivity organizations for specific industries important to their region could prove valuable. Technical assistance to small and medium-sized firms implementing these technologies could also prove useful.

Issue: Large near-term productivity enhancements can be accomplished through innovative management techniques.

Management

A more immediate and perhaps, even larger, improvement to productivity which does not require significant use of scarce investment resources may be found in alternative management practices which emphasize quality as well as quantity. The potential productivity increases resulting from the adoption of this philosophy offer probably the best short-run opportunities -- and it is an area where productivity organizations could have a major impact.

As previously stated, management in manufacturing developed a persisting adversarial relationship with labor after the onset of the Industrial Revolution in the U.S. Added to this was a management philosophy popularized by Taylor, which came to be known as "scientific management."

The central precept of scientific management is the methodical analysis of the production process, including breaking it down into its most elemental steps which are subjected to time and motion studies. The goal, of course, is to optimize the use of each factor of production. In practice, however, the philosophy has tended more toward optimizing mechanical elements of the work, with the human element being secondary. Jobs for labor were predicated on the needs of the machine.

Labor's response to this has been, in general, to obstruct mechanization whenever possible in any of its forms, and to press for improvements in extrinsic rewards, such as salary, benefits, and security, rather than the intrinsic rewards of variety and challenge, learning, and the use of discretion. This can, at least partly, be traced back to the adversarial management/labor relationship. Both sides needed clear-cut, quantifiable, and verifiable measures by which bargaining issues could be measured. The extrinsic rewards provided this; the intrinsic rewards did not.

Along similar lines, the nation's management developed an attitude which emphasized production quantity, as easily measured, as opposed to quality. The new technologies do provide some quantity

advantages, but their major value is in the potential for increasing quality. One reason the Japanese have been able to compete so effectively is that the higher quality of their production processes reduces their own production costs by reducing defect corrections and waste, while at the same time providing their consumers with more reliable products. Therefore, in order for U.S. companies to take advantage of potential quality increases embodied in the new technology, some very basic and in some ways drastic, changes will have to be made. Such changes overshadow the hardware changes both in terms of the difficulties and rewards they entail.

It is widely recognized that the highly lauded Japanese management style cannot simply be transplanted in its entirety to America with any hope of success. Such a move is likely to do more harm than good. For example, a company that establishes a quality circle which produces a labor-saving procedure and responds by firing a worker upon its implementation, is not likely to achieve a long-term productivity gain. There are, however, essential elements of the quality-oriented management philosophies which have proven effective in American companies. While it is not possible to eliminate the current adversarial nature of labor/management relations, it is possible to reduce labor's impression of management as an exploiter through the use of gain sharing techniques and provisions for job security. Possible avenues for increasing job security include work-sharing, job rotation, using slack periods for maintenance, employee exchange among divisions, and the use of subcontracting and temporary hiring for peak periods. Also, many people are beginning to feel that the definition of a standard work week as 40 hours (which has stood since 1930) should now be reexamined.

Other elements of quality-oriented management philosophies include sharing decision making power. This is more easily implemented in the Japanese system because all management personnel begin their employment by first spending time on the factory floor where they must be successful in order to advance. Simultaneously, labor is more involved in the decision making process and can,

therefore, see management's problems from their perspective. In the U.S. (at least in large- or medium-sized firms), labor unions view the presence of management on the factory floor with suspicion, and management considers labor unqualified to make production decisions. It is certain that these perspectives will not change over night. It is equally certain that they must change if the productivity challenges of international competition are to be met.

One way to ameliorate this adversarial relationship in order to pave the way for shared decision making is through what are known as quality-of-work-life (QWL) programs. The goal of these programs is to increase the quality of work through increases in the quality of the work environment. This can include such things as recreational and day care centers and educational programs provided as rewards for higher quality work. These programs can also be used to address job security and job challenge issues through job rotation.

The implementation of these philosophies is made more difficult by the decline in employment per unit of output and the restructuring of job skills expected with the new technologies. It is likely that job retraining programs of new types may be called for to supplement the shift of employment from the factory floor to the office. In all of these programs, cognizance must be made of the negative impacts of discriminatory hiring and promotion policies and attitudes because of the higher proportion of minorities and women expected in the future labor force.

Because the institutional impediments to changes in management philosophy tend to be greater in larger, more established firms, it is likely that most of the adoptions in the near future will occur in smaller, newer firms. As successes are proven, the penetration rate into larger firms will increase.

Office Work Place

Issue: The proportion of the labor force working in the office is increasing; the priority given office productivity issues needs to increase accordingly.

Even though quality enhancement programs in the manufacturing sector through innovative management appear to offer the greatest immediate productivity improvement opportunities, the long-run challenge resides in the service sector. It is here that most of the labor force works, and even higher proportions are expected to do so in the future. Of all the employment sectors, office work is the largest and fastest growing. Productivity in the office, however, has not received the attention of productivity in the factory, even though it offers potentially larger benefits.

As office functions grew due to the increasing complexity of production processes, financial institutions, merchandising, etc., the management of the office borrowed from the Tayloresque scientific management philosophies previously applied to the factory. Job tasks were fragmented, assembly lines were established, hierarchial management structures evolved, and lines of communication were rigidly enforced by jealous regard for territories. As a curious by-product, employment levels were, by and large, maintained during downturns.

With some spectacular exceptions, the technological revolution largely bypassed the office. Until very recently, the only technologies which had penetrated the office were the typewriter, the dictaphone, and the telephone. Of these three, only the telephone offered clear-cut productivity improvements -- and some would regard even that conclusion as speculative. As for the typewriter, it certainly made communication more legible but typing only represents an additional step in the communications process. A major exception to the slow rate of change in the offices was the wide and rapid acceptance of magnetic ink character readers (MICR) in the commercial banking industry. This innovation dramatically reduced the cost of

processing checks and increased the quality of check cashing services. It also changed the structure of the bookkeeping department. The need for bookkeepers was reduced and the need for key punch/typists was increased. The knowledge level required fell except for those in management.

Other areas where the new technologies have had a large impact have been, similarly, where large volumes of standardized transactions are occurring, particularly in the commercial sector. These include airline reservation systems, payroll and invoicing systems, and order entry merchandising.

In all of these areas, the labor force has been restructured. One development has been the rise of the "information middleman," where the point of contact with the consumer assumes global responsibilities through access to comprehensive data bases. These data bases include product availability, price, and delivery schedules, as well as account information on particular customers.

Another development has been the extension of sales duties to include primary inventory movement recording at the point of sale. It should be noted that these developments are in exactly the reverse direction of "scientific" management's prescription of work task disaggregation. It requires information sharing across organization lines, and it also implies a redelegation of authority to lower levels.

Automatic teller machines (ATM) and universal product codes (UPC) represent further developments of technology which promise to have an increasing impact in the commercial service sector. Both of these technologies represent a diminution of the human element in standard transactions.

Extensions of these technologies are not difficult to see. For example, it is technically feasible today to design a grocery store with no check-out clerks. Customers would check out their own groceries by exposing the UPCs and pay for their purchase with bank cards. It is also technically feasible to have salary checks relayed

automatically to the employee's bank, though only a few large institutions now offer this option. Customer payments, both individual and corporate, could also be made electronically. The evolution of the cashless society depicted here has not developed as rapidly as previously predicted, however, due to a lack of consumer acceptance. Fears of abuse, lack of privacy controls and documentation, and fear of errors not easily corrected have resulted in an abiding distrust of too much electronics in our commercial system --and they are liable to persist into the foreseeable future.

Developments which have yet to make their full impact felt in the office could be classed generally as information storage, retrieval, and analysis. This would include word processing, decision support-systems, and communications.

Used to its greatest potential, the word processor makes much of the paper flow in an office obsolete. Memos, letters, and reports could be entered via a remote work station directly into a word processing center where it could be corrected, edited, and formatted by persons trained in those areas, as well as in technical, word processor operation skills. At present, this type of system has reached its greatest acceptance only in the publishing industry, where reporters, sometimes over phone lines halfway around the world, enter their stories into the word processor. After electronic editing, the story is then sent, electronically, to the print room where lasers are used to manufacture the printing plates.

A major difference between the publishing industry and other industries, however, is that reporters know how to type -- and they do not mind doing it. Acceptance of this kind of paperless office system in other industries is, therefore, likely to be slow.

A development being accepted more readily, however, is the concept of electronic mail for routine internal communication. This type of communication can reduce costs by an order of magnitude. By linking up word processing to remote locations, it is also possible to transmit reports to any remote location instantaneously. A dramatic

new technology now being developed is voice-activated input. At present, the capabilities are extremely limited, but over the long term, those limitations will surely vanish. As direct verbal-to-electronic technology develops, both the paper and paper handlers in the office will be greatly diminished.

Issue: The complex interactions of office functions require the application of a systems approach, as opposed to a scientific management approach, to realize the full potential of present and future office technologies.

As more and more areas become linked up (for example, in the offices of manufacturers, production activity is linked to inventory, which is linked to purchasing and accounting, and is further linked to sales, customer accounts, and budget/cost control personnel), the information available to knowledge workers explodes. The typical response to this explosion has been to hire more knowledge workers and support for them. This has partly been allowed to occur because cost controls on overhead functions are typically much less than those in place for production. There is evidence now, though, that management is attempting to come to grips with the problem. A 1983 Harris poll indicated that 40% of the 1,200 corporations in Business Week's Corporate Scoreboard cut middle management in 1982. Almost half of the cuts were in the 20%-40% range.^{8/} Somewhat disturbing was the fact that half the people who made these cuts did so across the board. This seems to indicate that, rather than systematically analyzing the appropriate areas to cut, cuts were made somewhat arbitrarily. Two explanations are available for this: first, across the board cuts are probably a more politic course to take; secondly, objective measures of productivity in the office hardly exist, so management has no

^{8/} "People and Productivity: A Challenge to Corporate America," New York Stock Exchange Office of Economic Research, 1982, as reported in the White House Conference on Productivity, 1983.

yardstick by which to measure the effectiveness of office workers. Because office workers comprise the majority of employment in the present (and most probably the future), their productivity is crucially important to the productivity of the nation as a whole.

One of the keys to managing the information explosion in the office has a parallel in the manufacturing sector: a revised emphasis on quality, rather than quantity. Only in this fashion can the information available be used for planning purposes as well as day-to-day operations. As markets become more internationally competitive, the effectiveness of strategic planning becomes greatly important, particularly in maintaining flexibility and responsiveness to market changes.

Issue: Office technologies tend to polarize skill levels into high and low categories, creating potential worker dissatisfaction and lower productivity.

Office and commercial sector technologies are generating changes which are common to virtually all applications. Currently, there is an increasing polarization of skill levels with a concomitant limitation on upward mobility. The increased productivity thus achieved is at the cost of creating a low-skill, high-stress, high-turnover, low-pay cadre within the work force. The consequences of this are aptly presented in an article in the September 21, 1983 Atlanta Constitution based on a survey of insurance company clerical employees. The results detailed physical problems, such as eye strain from video display terminals and back strain from poorly designed office furniture, as well as the problems of low pay and low opportunity for advancement. Management's response was to describe the generous fringe benefits, reduced work week and "ample" break policy; the workers response was a call to organize for control of their working environment and the technology used.

The pattern revealed here is consistent with those previously discussed in the manufacturing section: an emphasis on extrinsic

factors as a means of dealing with intrinsic problems. A continuation of this emphasis will undoubtedly lead to adversarial stances and increased unionism. Over the long run, the emerging technologies will further reduce the low-skill labor requirements which, if not handled properly, will further erode management's credibility and worker morale. As in manufacturing, the tools for effective management in the office would be quality of work-life programs, educational/training programs for advancement/transfer, and shared decision making powers.

Issue: Office technologies require a reexamination of the degree to which the decision making process is centralized or decentralized.

Another shifting structure in the modern office work place is the degree to which functions are centralized or decentralized. In the past, information was decentralized and under the control of those collecting it. Decision making, on the other hand, was centralized. The information needs of the modern organization dictate that information be centralized and available to a decentralized network. The work-units collecting information no longer have control over its access or its uses, and their tasks must be coordinated with the information collecting functions of the other units. What information is collected is also controlled by units outside the collecting unit.

Simultaneously, the decision making process is becoming decentralized, but more highly structured, which has the advantage of increased productivity for standard transactions, but decreased capability to handle nonstandard transactions. Exactly where the proper balance between centralization and decentralization of information use and decision making exists cannot be answered a priori. It is evident, however, that the problem cannot be addressed by Tayloresque scientific management methods. Instead, modern management must take a systems approach, explicitly recognizing interconnections, and attempt to optimize globally, even if it means

suboptimal performance of individual units. The quest for global optimization will likely result in an expansion of decision support functions, as the present emphasis on information collection and storage is diminished through automation.

Educational Work Place

This sector of the economic system is widely recognized as one of the more crucial to long-term growth in productivity. It is also one of the most labor-intensive areas, but indications are that this may be changing, even in an era where the student population remains about level. The increase in capital intensity is likely to occur for two reasons. The first is to correct weaknesses which seem apparent in the nation's educational system. Functional illiteracy levels have been estimated as high as 20% and the educational profession is not able to retain enough math and science teachers at the secondary level. The second reason is that the perception of the importance of computer literacy is growing. As computers penetrate the classroom for the purpose of providing computer literacy, it is extremely likely that the capabilities of the computer as a teaching tool in other subjects, such as math and science, will be increasingly utilized and may, in fact, be necessary if the demands for labor skills in the modern work place are to be satisfied.

Issue: The educational sector has need of higher capital intensity and increased level of specialization.

This portends a restructuring of the skills required by the educational sector in that specialization beyond subject areas are likely to develop. Specialists in the capabilities of computer controlled learning techniques and technologies will be needed. Also, the socialization skills development and psychological needs of students in a video terminal school will also need to be explicitly addressed. Though there are dangers in overly electronic schools, there are also advantages. Successful educational software can easily

be reproduced and provided equally to all students, thus eliminating the problem of substandard educational opportunities in low income areas. It also enables the separation of social development and intellectual development from the current somewhat arbitrary classification by age.

The problem of increasing the quality of our primary and secondary educational system is exacerbated by the lack of funding and, also, the lack of computer skills of the teachers. A direction which has been advocated has been to involve local businesses, where expertise resides, in the educational process.^{9/} IBM, for example, has an active employee loan program and hardware grant program to give students the benefit of their experience. The expansion of such programs could serve U.S. corporations well in insuring that the labor force has the skills necessary for competency in the modern work place. A secondary benefit would be to reduce the need for post-secondary educational activities, which now serve to fill some of the gaps left by an inadequate primary and secondary educational system.

^{9/} "People and Productivity: A Challenge to Corporate America," New York Stock Exchange Office of Economic Research, 1982, as reported in the White House Conference on Productivity, 1983.

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PRODUCTIVITY INFRASTRUCTURE, ISSUES, AND RECOMMENDATIONS

The following section summarizes the issues identified from the characterization of productivity organizations, national productivity trends, emerging trends, and the responses of the 17 "representative" productivity organizations visited. It also formulates recommendations. An "issue" in this context, as throughout the report, is defined as an area of significant concern in which direct action needs to be taken to ensure improved national productivity. The issues are sequential according to the data source from which they were derived. The recommendations define what actions need to be pursued.

Issues identified from productivity statistics and research were:

Issue: During the 1970s and early 1980s, the nation's productivity growth rate did not attain its potential and the nation experienced a lower productivity growth rate than did its competitors in the international marketplace.

Issue: The incorporation into production of knowledge new to the organization, whether it be managerial, organizational, or technological, is the key factor in increasing productivity growth.

Issues identified examining the productivity organizations' data were:

Issue: Productivity organizations, in general, are small and very limited with regard to the resources they can draw upon and range of productivity services they offer.

Issue: Substantial gaps exist in the national productivity infrastructure in terms of both geographical coverage and the range of productivity services provided.

Issues identified from the "representative" productivity organization interviews were:

Issue: Quality of work life issues and labor/management cooperation are essential to improved productivity in the future.

- Issue: Objective means of measuring productivity at the firm level and for interfirm comparisons are needed.
- Issue: Standard training course modules can help ensure quality in productivity services.
- Issue: New technologies and management practices are important for improving productivity, but transferring existing techniques will be very important as well.
- Issue: Most productivity organizations have not developed sources of funding which will provide sufficient and continuous support.
- Issue: University-based productivity organizations have problems establishing an independent identity and establishing visibility.
- Issue: Competition among productivity organizations impedes the free exchange of information and inhibits profitable interaction.
- Issue: The federal government has not devoted sufficient resources to its productivity activities and has not sufficiently utilized the regional productivity organizations.
- Issue: A national program is needed to fund productivity-oriented research.
- Issue: Important factors impede interaction among productivity organizations.
- Issue: A national productivity office would be desirable, but it must not become a bureaucracy.
- Issue: Little current support exists among the productivity organizations for instituting an accreditation procedure for their organizations.

Issues identified from examining emerging trends were:

- Issue: As the proportion of women and minorities in the work force increase in the future, responsiveness to special needs and nondiscriminatory policies become increasingly important.
- Issue: The new technologies lack adequate standardization in operating systems and communications.

- Issue: The new technologies tend to polarize worker skills into high and low categories.
- Issue: Large near-term productivity enhancements can be accomplished through innovative management techniques.
- Issue: The proportion of the labor force working in the office is increasing; the priority given office productivity issues needs to increase accordingly.
- Issue: The complex interactions of office functions require the application of a systems approach, as opposed to a scientific management approach, to realize the full potential of present and future office technologies.
- Issue: Office technologies tend to polarize skill levels into high and low categories, creating potential worker dissatisfaction and lower productivity.
- Issue: Office technologies require a reexamination of the degree to which the decision making process is centralized or decentralized.
- Issue: The educational sector has need of higher capital intensity and increased level of specialization.

The following recommendations are based on the "issues" identified in the preceding sections. Recommendations are defined as the actions that should be taken by either the private sector or the federal government to improve national productivity. Some of the issues these recommendations address originated from interactions with the productivity organizations. It should be recognized that although these productivity organizations generally share a common aim, they often have sharply different philosophies and, therefore, every organization might not agree with every specific interpretation of what actions are required. These recommendations were developed within the context of the Reagan administration's philosophy that the proper policy for the economy is to provide a favorable climate for economic growth, with government interference held to a minimum.

The recommendations essentially recognize that there should be a formal organization of productivity organizations and that such an organization or network will be very limited in its impact without

national leadership and infrastructure support. The current informal productivity infrastructure is fragmented; individual centers are isolated and do not have the impact they could as part of an active, innovative, supportive network. The recommendations address the opportunity for the federal government to take an active role in providing leadership and support to leverage existing productivity resources in order to fill significant gaps in the provision of productivity services nationwide.

Recommendation: The private sector should replace the informal national network of productivity organizations with a formal organization.

The importance of a formal organization can be seen from the urgent productivity problems the nation has struggled with since the early 1970s. Systematic action must be taken to bring new or under-used managerial, organizational, or technological knowledge to all sectors of the national economy. These technologies and management practices may be recently developed, or they may have existed for some time but never applied to the degree to which their fullest potential for improving productivity can be realized. A formal national productivity organization will prove the best means of attaining these ends.

A national organization would also achieve needed economies of scale in the productivity effort by pooling the resources and techniques of typically constrained productivity organizations and encouraging the development of standardized productivity techniques all the organizations could use. The organization would in this way encourage profitable interaction among the productivity organizations, helping to diminish the unhealthy competition some organizations mentioned and reducing the extent to which the organizations will unnecessarily reproduce each other's effort.

The formal organization would also provide an important mode for federal interaction on productivity issues. And while it would not "accredit" specific organizations, the formal organization would help

ensure a high quality of productivity services and would help validate productivity techniques that organizations have tested and proven effective.

Finally, membership in a recognized national organization would help provide the visibility that many regional productivity organizations are still struggling to achieve. See Appendix D for a statement on the need and objectives of a national network of productivity organizations prepared during this study by a number of the organizations.

Recommendation: The federal government should adopt a position of active leadership and establish a national productivity office to provide a focus for improving the nation's productivity.

A national productivity office would provide an important focus for spearheading the drive for productivity improvement and would make people aware that the government is strongly behind their productivity efforts. Through this office, the federal government could also work to establish a clear, energetic national productivity policy that would provide a context in which the effort of productivity organizations can find direction and an identity.

For it to be effective and vital, however, the national office must not be allowed to burgeon into a large bureaucratic organization, or even to be perceived as such an organization.

In addition, in order to be fully effective, the national productivity office must have the stature within the administration to command respect and recognition, to obtain visibility and consideration for productivity issues, and to interact confidently and on an equal footing with other government agencies.

An expansion of the productivity leadership role that the Office of Productivity, Technology and Innovation (OPTI) established in September 1981 could provide the focus that the productivity organizations believe is needed (see Appendix E). The primary mission of OPTI with respect to productivity has been to develop an improved public policy environment for advancing private sector productivity.

Recommendation: The federal government should implement a policy designed to strengthen the formal organization established by the independent productivity organizations.

The productivity crisis that currently exists in this country has deep roots, and systematic, cooperative action on the part of productivity organizations, the private sector, and the federal government will be required to resolve it. A formal productivity organization, actively supported by federal government policy, will be able to effectively address the significant gaps that currently exist with regard to both the range and geographical areas covered by the existing fragmented productivity infrastructure. Support for the establishment of a cohesive national productivity network will very likely encourage the development of new productivity organizations that will also play a valuable role in filling these gaps.

The present productivity infrastructure has a great deal more potential for impact than is currently being realized. One "benefit" of this suboptimization is that small amounts of support can generate substantial increases and improvements in the quality and availability of productivity services.

This Recommendation calls for federal funding support in small increments in order to bring about these much needed improvements. The federal government could work with productivity organizations to define an accurate national aggregate picture of productivity needs and to match these needs with the extensive collective resource of the individual organization within the formal productivity structure.

Recommendation: The federal government should provide funds to support the creation of a formal national productivity organization during its start-up period.

This Recommendation calls for a demonstration grant for three years at a decreasing level of funding to help establish the formal productivity organization. The period of three years would provide sufficient time for the independent organizations to identify the best ways in which they could work together and to define the most

beneficial structure and arrangement of activities. It would also provide a reasonable amount of time for the organizations to identify other sources of financing for themselves.

Recommendation: The private sector and federal government should increase the dissemination of productivity information.

- 1. The federal government should provide funds to support the dissemination of emerging productivity-improving techniques.**

In order to encourage increased interaction among productivity organizations and ensure that effective productivity techniques reach the widest possible audience and achieve their greatest potential impact, the federal government should provide funds to support the dissemination of emerging productivity improvement techniques.

A number of excellent techniques have been developed by productivity organizations. These techniques can have an immediate effect on the nation's productivity future and will increase the array of tools productivity organizations can use and generate income with.

A good example of such a technique is the "objectives matrix" designed by the Oregon Productivity Center. This technique, which has been extensively field-tested, can measure productivity at the department or firm level. It is easy to apply and has the potential to have a very great impact. It deserves wide dissemination.

To further dissemination, current technology should be employed to support the establishment of a clearinghouse for productivity materials and inquiries. This does not imply a single central clearinghouse which might require continuous funding support. The development of a subject heading list of standard productivity terms by the Commerce Productivity Center could prove useful because it would provide consistency by the productivity organizations in categorizing items.

To enact this recommendation, the federal government should provide funds to help document and present productivity improvement techniques that have been thoroughly tested. Four to ten grants in the \$5,000-\$10,000 range would be sufficient to bring very effective techniques to many productivity organizations.

2. **The private sector should establish an electronic mail network and productivity newsletter to facilitate information exchange among the productivity organizations.**

The need to establish a newsletter and an electronic mail network was discussed at the National Productivity Network meeting at the Georgia Institute of Technology on October 27 and 28, 1983. The newsletter has been implemented (see Appendix F) and the development of an electronic mail system to link all productivity organizations in the network is currently underway.

Recommendation: The federal government should provide funds for the direct support of productivity-oriented research.

While many projects have been funded that have indirect benefits for productivity, the federal government should begin providing direct support for productivity research. The wide range of issues taking shape regarding the introduction of new technologies to the work place and the changing nature of the work force will require a systematic approach for their effective resolution.

With small seed grants solicited in a competitive manner, the federal government could fund research with the provision that the research be designed to produce a specific productivity improvement method and would contain an implementation phase during which it would be applied under actual conditions.

Four to ten grants per year in the \$20,000 to \$50,000 range would be sufficient to stimulate the development of a number of techniques now in the embryo stage.

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APPENDIX A

Productivity Organizations' Directory

An alphabetical listing is provided for those productivity organizations that meet the two specific criteria: a primary mission of productivity improvement and a nonprofit structure. The information provided for each organization is:

- o Name, address, telephone number, and title of the person to be contacted
- o The major orientation of the productivity organization (i.e., human relations, management, etc.)
- o The percentage of total expenditures spent on assistance, education, publication, research, and other
- o Year established
- o Staff size in terms of full-time equivalent professionals and support

American Center for Quality of Work Life

3301 New Mexico Avenue, N.W.
Suite 202
Washington, D.C.
202-338-2933

Contact: Kevin M. Sweeney

Major Orientation: Human relations Organized: 1974

Activity Distribution: Assistance - 40%; Research - 60%

Staff in full-time equivalents: professionals - 22; support staff - 2

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American Productivity Center

123 N. Post Oak Lane
Houston, TX 77024
716-681-4020

Contact: Kathleen C. Sutton

Major Activity: Human relations Organized: 1977
Management

Activity Distribution: Assistance - 33%; Education - 33%;
Publication - 17%; Research - 17%

Staff in full-time equivalents: professionals - 40; support staff - 10-25

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Bowling Green Productivity & Gainsharing Institute

Bowling Green State University
Bowling Green, OH 43403
419-372-0016

Contact: Timothy L. Ross, Director

Major Orientation: Human relations Organized: 1980
Management

Activity Distribution: Assistance - 70%; Publication - 15%;
Research - 15%

Staff in full-time equivalents: professionals - 4; support staff - 1

**Center for the Analysis of Productivity-
International Perspective**

Towson State University
School of Business and Economics
Towson, MD 21204
301-321-3342

Contact: Dr. Andrew Tuff

Major Activity: Human relations Organized: 1982
Management
Technical

Activity Distribution: Assistance - 20%; Education - 30%
Publication - 30%; Research - 20%

Staff in full-time equivalents: professionals - 9; support staff - 20

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Center for Effective Organizations

Graduate School of Business Administration
University of Southern California
Los Angeles, CA 90089
213-743-8765

Contact: Dr. Edward E. Lawler III, Director

Major Orientation: Human relations Organized: 1980

Activity Distribution: Assistance - 15%; Education - 10%;
Publication - 15%; Research - 60%

Staff in full-time equivalents: professionals - 5; support staff - 15

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Center for Government & Public Affairs

Auburn University
Montgomery, Alabama 36193
205-271-9300

Contact: Dr. Raymond B. Wells

Major Activity: Management Organized: 1975

Activity Distribution: Assistance - 65%; Education - 5%;
Publication - 10%; Research - 20%

Staff in full-time equivalents: professionals - 5; support staff - 2

Center for Productivity Innovation & Technology
Chattanooga State Technical Community College
4501 Ammicola Highway
Chattanooga, TN 37406
615-622-6262

Contact: Ollie Benton, Director

Major Orientation: Human relations Organized: 1981
Management
Technical

Activity Distribution: Assistance - 25%; Education - 50%;
Research - 25%; seminars, workshops

Staff in full-time equivalents: professionals - 1;

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Center for the Improvement of Productivity
George Mason University
4400 University Drive
Fairfax, VA 22030
(703) 323-2124

Contact: David Bushnell

Major Orientation: Human relations Organized: 1978

Activity Distribution: Assistance - 25%; Education - 15%;
Publication - 5%; Research - 55%

Staff in full-time equivalents: professionals - 1; support staff - 1

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Center for Study of Private Enterprise
Baylor University
Waco, TX 76703
817-755-3766

Contact: Calvin Kent

Major Orientation: Management Organized: 1978
Technical

Activity Distribution: Assistance - 40%; Education - 40%;
Publication - 20%; innovation evaluation center;
33 criteria list; inventions; venture assistance
firms.

Staff in full-time equivalents: professionals - 7; support staff - 9.5

Department of Management

University of Arizona
Tuscon, Arizona 85721
602-965-7626

Contact: L. William Seidman

Major Orientation: Organized:

Activity Distribution:

Staff in full-time equivalents:

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Division of Extension & Public Services

New York State School of Industrial & Labor Relations
Cornell University
3rd East 43rd Street
New York, NY 10017
212-599-4573

Contact: Jack Kaufman

Major Orientation: Management Organized: 1946
Human Relations

Activity Distribution: Education - 70%; Research - 30%

Staff in full-time equivalents: professionals - 32; support staff - 33
(plus contracted consultants)

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Florida Center for Productivity

Florida State University
306 Stone Building
Tallahassee, FLA 32306
904-644-6777

Contact: Frank Banghart, Director

Major Orientation: Technical Organized: 1979

Activity Distribution: Assistance - 25% (technical); Other - 75%
(training); Ad Hoc studies for state agencies,
cost studies, training, etc.

Staff in full-time equivalents: professionals - 1; para professionals - 2;
support staff - 1

Georgia Productivity Center
Georgia Institute of Technology
Atlanta, GA 30332
404-894-3404

Contact: Rudy L. Yobs, Director

Major Orientation: Management Organized: 1975
Technical

Activity Distribution: Assistance - 60%; Education - 15%;
Publication - 10%; Research - 15%

Staff in full-time equivalents: professionals - 110; support staff - 35

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John L. Gray Institute
Lamar University
P.O. Box 10067
Beaumont, TX 77710
409-838-8955

Contact: Steve Lawrence, Director

Major Orientation: Human relations Organized: 1981

Activity Distribution: Assistance - ; Education - ;
Publication - ; Research -
Breakdown not available

Staff in full-time equivalents: professionals - 3½; support staff - 21

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Institute for Productivity
592 DeHostose Avenue, Baldrich
Hato Ray, Puerto Rico 00918
809-764-5145

Contact: Milagros Guzman, President

Major Orientation: Human relations Organized: 1977

Activity Distribution: Assistance - 50%; Research - 25%; Other - 25%

Staff in full-time equivalents: professionals - 15; support staff - 2

International Association of Quality Circles

Suite 301
801 B W. 8th Street
Cincinnati, OH 45203
513 381-1959

Contact: Darius Van Fossen, Director

Major Orientation: Management Organized:

Activity Distribution: Assistance - 50%; Education - 25%;
Publication -25%; asst. through local chapters; 1
week facilitation courses; newsletter

Staff in full-time equivalents: professionals - 6; support staff - 4

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Laboratory for Manufacturing and Productivity

School of Engineering
Building 35
Massachusetts Institute of Technology
Cambridge, MA 02139
617-253-3503

Contact: Dr. George Chryssolouris

Major Orientation: Organized:

Activity Distribution:

Staff in full-time equivalents:

* * * *

Management & Behavioral Science Center

The Wharton School of the University of Pennsylvania
Vance Hall
3373 Spruce Street
Philadelphia, PA 19104
215-898-5674

Contact: Charles Dwyer or Thomas Gilmore

Major Orientation: Management Organized: 1950s or 60s

Activity Distribution: Assistance - 25%; Education - 25%; Research - 50%

Staff in full-time equivalents: professionals - 12; support staff - 4

Manufacturing Productivity Center

IIT Center
10 West 35th Street
Chicago, IL 60616
312-567-4800

Contact: Dr. Keith E. McKee

Major Orientation: Technical Organized: 1977

Activity Distribution: Assistance - 25%; Education - 15%;
Publication - 10%; Research - 50%

Staff in full-time equivalents: professionals - 200; support staff - 50

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**Maryland Center for Productivity &
Quality of Working Life**

University of Maryland
College Park, MD
301-454-6688

Contact: Tom Tuttle, Director

Major Orientation: Human relations Organized: 1977
Management

Activity Distribution: Assistance - 25%; Education - 25%;
Publication - 25%; Research - 25%

Staff in full-time equivalents: professionals - 3; support staff - 3

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University of Massachusetts

Institute of Government Services
Downtown Center
Boston, MA 02125
617-542-6570

Contact: William Coughlin, Program Administrator

Major Orientation: Human relations Organized: 1970

Activity Distribution: Assistance - 30%; Education - 60%;
Publication - 10%

Staff in full-time equivalents: professionals - 15; support staff 8 - 10

Michigan Quality of Work Life Council

755 W. Big Beaver Road
Suite 508
Troy, MI 48084
313-362-1611

Contact: Basil J. Whiting

Major Orientation: Human relations Organized: 1979

Activity Distribution: Assistance - 50%; Education - 30%;
Publication - 5%; Research - 5%;
Other - 10% (organizing local labor mgmt.)

Staff in full-time equivalents: professionals - 5; support staff - 2;
½ time volunteer - 2

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National Center for Public Productivity

City University of New York
New York, NY 10019
212-489-5030

Contact: Marc Holzer

Major Orientation: Human relations Organized: 1975
Management
Technical

Activity Distribution: Assistance - 10%; Education - 60%;
Publication - 20%; Research - 10%

Staff in full-time equivalents: professionals - 28; support staff - 6

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North Carolina State

Productivity Research & Extension Program
P.O. Box 5511
Raleigh, NC 27607
919-733-2370

Contact: Dr. William A. Smith, Jr.

Major Orientation: Technical Organized: 1975

Activity Distribution: Assistance - 20%; Education - 50%;
Publication - 6%; Research - 21%; Other - 3%

Staff in full-time equivalents: professionals - 18.2; support staff - 12.2

Northeast Labor-Management Center, Inc.

55 Wheeler Street
Cambridge, MA 02138
617-492-8893

Contact: Mike Brown, Director
Jim Curley, Consultant

Major Orientation: Management Organized: 1975

Activity Distribution: Other - 100%; consulting assistance

Staff in full-time equivalents: professionals - 2; support staff - 2;
associates - 3-6;

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Oklahoma Productivity Center

Oklahoma State University
Stillwater, OK 74078
(404) 624-6055

Contact: Dr. Scott Sink, Director

Major Orientation: Management Organized: 1976

Activity Distribution: Assistance - 25%; Education - 25%;
Publication - 25%; Research - 25%

Staff in full-time equivalents: professionals - 3; support staff - 1

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Oregon Productivity Center

Oregon State University
Corvallis, OR 97331
503-754-3249

Contact: Glenn H. Felix - Dr. James L. Riggs

Major Orientation: Management Organized: 1980
Technical

Activity Distribution: Assistance - 45%; Education - 20%;
Publication - 15%; Research - 20%

Staff in full-time equivalents: professionals - 3; support staff - 1.25

Organization Behavior Program

Institute for Social Research
University of Michigan
426 Thompson Street
P.O. Box 1248
Ann Arbor, MI 48106
(313) 764-8449

Contact: Cortland Cammann

Major Orientation: Human Relations Organized: 1953

Activity Distribution: Research - 70%; Assistance - 30%

Staff in full-time equivalents: professionals - 4

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Pennsylvania MILRITE Council

513 Finance Building
Harrisburg, PA 17120
717-783-7408

Contact: Greg Robertson
Bob Coy

Major Orientation: Management Organized: 1978
Technical

Activity Distribution: Assistance - 20%; Research - 80%

Staff in full-time equivalents: professionals - 2; support staff - 1

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Pennsylvania Technical Assistance Program (PENNTAP)

Pennsylvania State University
University Park, PA 16802
814-865-0427

Contact: Leroy Marlow

Major Orientation: Technical Organized: 1965

Activity Distribution: Assistance - 100%

Staff in full-time equivalents: professionals - 14; support staff - 3

Productivity Center

Department of Industrial Engineering
University of Arkansas
Fayetteville, Arkansas 72701
501-575-3156

Contact: Dr. John Imhoff, Director

Major Orientation: Technical Organized: 1980

Activity Distribution: Assistance - 55%; Education - 30%;
Publication - 10%; Research - 5%; Technical
assistance to organ. & industry; seminars;
workshops; newsletter

Staff in full-time equivalents: Dr. Imhoff is working part-time and alone
on project - they hope to include a secretary and part-
time professional.

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Productivity Center

Georgia State University
University Plaza
Atlanta, GA 30303
404-658-4250

Contact: Dr. Stanley J. Smits

Major Orientation: Human relations Organized: 1982

Activity Distribution: Assistance - 3%; Education - 3%;
Publication - 4%; Research - 90%

Staff in full-time equivalents: professionals - 18½; support staff - 0

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Productivity Center

U.S. Chamber of Commerce
1615H Street
Washington, D.C. 20062
202-659-6000

Contact: Dr. John Volpe

Major Orientation: Management Organized: 1978

Activity Distribution: Education - 99%; Research - 1%

Staff in full-time equivalents: professionals - 1.75; support staff - 2

Productivity Center of the Southwest

26004 Crenshaw Boulevard
304-A
Palos Verdes Peninsula, CA 90274
213-643-1168

Contact: Mr. John Herman

Major Orientation: Management Organized: 1977

Activity Distribution: Education - 80%; Publication - 10%;
Research - 10%

Staff in full-time equivalents: professionals - 12; support staff - 0

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Productivity Evaluation Center

Virginia Polytechnical & State University
302 Whitmore Hall
Blacksburg, VA 24061
703-961-4568

Contact: P.H. Ghare

Major Orientation: Technical Organized: 1980

Activity Distribution: Assistance - 5%; Education - 20%;
Publication - 25%; Research - 50%

Staff in full-time equivalents: professionals -1; support staff - 3

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Productivity Improvement Group

Industrial Relations Center
California Institute of Technology
CALTEC IRC 1-90
Pasadena, CA 91125
213-356-4041

Contact: Giles S. Hall, Jr., Director

Major Orientation: Human relations Organized: 1943

Activity Distribution: Education - 90%; Research - 10%

Staff in full-time equivalents: professionals - $\frac{1}{2}$; support staff - 1

Productivity Institute
College of Business Admin.
Arizona State University
Tempe, Arizona 85287
602-965-7626

Contact: Ms. Mickey Firebaugh

Major Orientation: Human relations Organized: 1975

Activity Distribution: Assistance - 60%; Education - 10%; Publications -
30; productivity info.; seminars; workshops; and
newsletter

Staff in full-time equivalents: professionals - 2

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**Purdue University - CIDMAC (Computer Integrated Design
Manufacturing and Automation Center)**

Purdue Productivity Center
School of Industrial Engineering
Grison Hall
West Lafayette, IN 49707
317-494-5441

Contact: Professor James Solberg

Major Orientation: Technical Organized: 1981

Activity Distribution: Research - 100%

Organized: 1981

Staff in full-time equivalents: professionals - 5; support staff - 5;
research professors -25;

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Quality of Working Life Program
Center for Human Resource Research
Ohio State University
5701 High Street
Worthington, OH 43085
614-422-7337

Contact: Bill Morgan

Major Orientation: Human relations Organized: 1975

Activity Distribution: Research - 80%; Publication - 5%; Other - 15%

Staff in full-time equivalents: professionals - 2; support staff - 6

Work In America Institute

700 White Plains Road
Scarsdale, NY 10583
914-472-9600

Contact: Jerome Rosow or Steven Smith

Major Orientation: Human relations Organized: 1975

Activity Distribution: Education - 33%; Publication - 33%
Research - 33%; Other - 1%

Staff in full-time equivalents: professionals - 9; support staff - 8

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Work in Northeast Ohio Council

220 North Main Street
Hudson, OH 44236
216-656-1977

Contact: J. Raleigh Thomas

Major Orientation: Human relations Organized: 1981

Activity Distribution: Assistance - 25%; Education - 25%;
Publication - 25%; Research - 25%

Staff in full-time equivalents: professionals - 5; support staff - 100

APPENDIX B

Representative Productivity Organizations

A classification scheme for productivity organizations was developed to facilitate the collection, reduction, and analysis of data (see methodology section). Using this classification scheme "representative" productivity organizations were identified for interviews. These organizations were "representative" of all productivity organizations in terms of orientation, activities, staff size, budget, geography, etc.

The information obtained from the in-depth interviews is presented in a narrative format and presents the opportunities and problems which face all productivity organizations similar to these "representative" ones. For each of these productivity organizations the narrative has been prepared which reduces the responses to the interview to these major areas:

- o primary mission of organization
- o nature and work of organization
- o organizational techniques and resources
- o major strengths of organization
- o organization's most successful project
- o organizational problems and needs
- o organizational changes envisioned for the next five years
- o future productivity issues
- o ideal productivity organization

Shown below are the classifications of the "representative" productivity organizations by major thrust or orientation and size.

	<u>Size</u>
Human Relations	
Center for Improvement of Productivity Fairfax, VA	Small
Michigan Quality of Work Life Council Troy, MI	Small

Work In America Institute Medium
Scarsdale, N.Y.

Human Relations/Management

American Productivity Center Large
Houston, TX

Maryland Center for Productivity and Quality of Working Life Small
College Park, MD

Utah Center for Productivity and Quality of Working Life Small
Logan, Utah

Management

Oklahoma Productivity Center Small
Stillwater, OK

Productivity Center Large
Chamber of Commerce
Washington, D.C.

Management/Technical

Georgia Productivity Center Large
Atlanta, GA

Oregon Productivity Center Small
Corvallis, OK

Texas Center for Productivity and Quality of Work Life Medium
Lubbock, TX

Texas Hospital Association Statewide Productivity Center Large
Austin, TX

Technical

Manufacturing Productivity Center Large
Chicago, IL

PENNTAP Medium
University Park, PA

Productivity Extension Program Medium
Raleigh, N.C.

Productivity Evaluation Center Small
Blacksburg, VA

Human Relations/Management/Technical

National Center for Public Productivity Medium
New York, NY

Center for the Improvement of Productivity
George Mason University
4400 University Drive
Fairfax, VA 22030
(703) 323-2124

Major Orientation:
Human Relations

Size: Small

Director: Mr. David Bushnell

Primary Mission of Organization

The primary mission of the Center for the Improvement of Productivity is to devise and evaluate collaborative strategies designed to strengthen an organization's productivity through the involvement of employees and management in collaborative programs.

Nature and Work of Organization

The Center for the Improvement of Productivity was recently established (1983) and has neither a formal charter nor a board of directors, though in the future it may organize a private sector dominated steering committee. The center's expenditures for academic year 1983-1984 are likely to total less than \$250,000. Approximately 90% of the center's total budget comes from grants and contracts, and the other 10% is provided by the university.

Sixty to seventy percent of the center's expenditures occur in the area of human resources utilization and development. Fifty-five percent of its expenditures are spent on research; 25% for assistance; 15% for education; and 5% for publication (distribution only).

Most of the center's expenditures will be spent in the U.S., with 40% of that amount spent in and around Washington, D.C. The center's staff is made up of one full-time professional and one EFT support staff. Various faculty throughout the university work on center research projects appropriate to their areas of interest and capability.

Organizational Techniques and Resources

The sources of the technology the center transfers to its clients are publications and workshops and seminars. Visits to industrial sites supplement these two modes of communication. As data resources the center uses the George Mason University library, the Library of Congress, commercial data bases, and journals and periodicals. The center maintains personal contacts with the productivity center at the University of Maryland and the Illinois Institute of Technology; corresponds with the center at the Virginia Polytechnic Institute; and maintains frequent contact with faculty members at George Mason University who have an interest in productivity topics. The center's director was recently president of the local chapter of the

International Association of Quality Circles. The center uses and develops training packages in productivity improvement awareness; quality circle implementation; management development; and small group problem solving processes.

The center uses journals, conferences, and research for projects as means to identify new technologies for clients. To develop contractual relationships with clients whose operations are in need of productivity improvement, the center evaluates and clarifies the nature of the problem; proposes a study; examines costs, outputs, and capital and human resources; develops recommendations based on prior experience; and customizes measurement indices. If the client desires, the center's efforts include strategic planning looking 5-10 years into the future.

The value of this orientation is reflected in the client's willingness to consider future-oriented productivity improvement strategies which go beyond the short term. Once the area of productivity improvement has been worked out with the client, the center then calls upon the faculty resources of the university to assist in the implementation of a client-oriented improvement program.

Major Strengths of Organization

The major strengths of the Center for the Improvement of Productivity in accomplishing its mission are its ability to bring interdisciplinary teams together and the access it enjoys to top management and private and public sector leaders, many of whom are located in the Washington, D.C. metropolitan area.

Organization's Most Successful Project

The newness of the center prevents it from having established a track record for successful projects. Since the current director served as director of American University's Center for Productivity Studies immediately prior to joining the staff at George Mason University, he has served as principal investigator on a number of productivity improvement-related projects. While at American University, he directed a study for the Potomac Electric and Power Co. designed to establish and evaluate three white collar quality circles. The company now has 30 circles in operation.

Organizational Problems and Needs

The Center for the Improvement of Productivity hopes to be effective in marketing its services and in achieving its program objectives. The major problems facing the center are generating sufficient financial resources to ensure a continuity of research projects and identifying the state of the art of productivity improvement to avoid the unnecessary duplication of research carried out elsewhere. The major problem likely to be encountered in promoting the center's services is the frequent breakdown between initial client

contact and actual contracts. To achieve its growth plans the center hopes to expand its financial resources and its opportunities for testing productivity improvement models in various private and public sector settings.

The center believes that its opportunities would be greater if it were part of a network representing all productivity centers throughout the U.S. It operates on the principle that its stature will be enhanced through the completion of significant studies within its area of concentration and through the stimulation of well-conceived papers and publications.

Organizational Changes Envisioned for the Next Five Years

The Center for the Improvement of Productivity foresees a slight decline in the percentage of expenditures it devotes to research and a corresponding rise in expenditures devoted to workshops, seminars, and publications. Similarly, the center foresees a slight decline in the amount of expenditures it devotes to the service sector and a corresponding increase in its services to the public sector (from 25% to 35%). It also hopes to work more closely with organized labor because of the critical role which they play in the support of labor-management collaborative efforts.

The center plans to expand its base of support through industry funding on a membership basis. A number of the center's clients have expressed interest in sociotechnical studies involving human responses to the adoption of new technology. Over the next five years, the center hopes to work closely with the engineering and hard science faculty at George Mason University in support of its multidisciplinary staff capabilities.

Future Productivity Issues

Areas of future opportunity for productivity improvement lie in such areas as strengthening small-group problem solving capabilities; devising better measures of total factor productivity; improving strategic planning; strategies to help organizations anticipate the use of evolving technology; and exploring alternative ways to involve employees in collaborative decision making and problem solving action research projects in organizational settings.

The Center for the Improvement of Productivity sees a need for developing training modules for increasing management awareness and ability to implement productivity improvement programs. The center also supports the recommendations of the White House Conference on Productivity to mount a national program to support further research in this field as a way of accelerating the "slow growth" economy predicted for this decade. Research topics should include man-machine interface; the process of technology transfer; the use of small group problem solving techniques; and strategies for improving collaboration among work teams, organizations, and educational institutions.

The center supports the need for a national productivity office, if such an office were devoted to strengthening coordination and communication among researchers and practitioners in this field. The national productivity office might provide access to information to ensure open communication; perform modest library research; sponsor workshops; and provide national recognition of companies and individuals who have made significant contributions to productivity improvement. The center also believes that national accreditation would be important to standardizing the training and qualifications of practitioners in the field.

The federal government should increase its role in the area of productivity by funding research and demonstration projects; creating tax incentives; and distributing information. In terms of technology awareness, the federal government should take a supporting role in influencing the education of scientists and technicians, and in effecting information exchange. The private sector and universities should have the primary role in implementation. With regard to technology development, the federal role should be to provide funding in high risk areas (basic research). In the area of technology transfer, the federal role can be significant as a clearinghouse, a source of seed money, and a disseminator of information. In terms of management education, the government should continue its support of higher education, but the private sector should have the primary role.

The federal government should support education and basic research in the area of human resources, for example in the behavioral sciences, to study motivation, learning, and work structuring. Also the federal government should act as a policy maker in the area of human resources to assist industry with retraining and worker relocation.

The support offered by networking, distribution and access to publications, and avoiding duplication of efforts are all ways of insuring increased interaction among productivity centers. The introduction of new technologies and improved management techniques will be important in improving the productivity of the center's clients. Technology will be very important for the next 15-20 years. The importance of management techniques will continue to grow.

Ideal Productivity Organization

If the center had the opportunity to establish a new productivity organization, its emphasis would be 50% on human resources; 30% on management; and 20% technical. The staff would include a full-time Associate Director for marketing services and public relations, and 6-7 full-time staff with access to technical consultants.

Michigan Quality of Work Life Council
755 West Big Beaver Road
Suite 508
Troy, MI 48084
(313) 362-1611

Major Orientation:
Human Relations

Size: Small

Executive Director: Mr. Basil J. Whiting

Primary Mission of Organization

The primary mission of the Michigan Quality of Work Life Council is to promote and facilitate the value and practice of employee involvement in problem solving and decision making through joint union/management cooperation.

Nature of Work of Organization

The council was established in 1979 and has by-laws and a board of directors, whose function is to govern and advise the council. The council's board of trustees has 55 members and its executive committee has 16 members drawn from the board. Fifty-five percent of the council's budget is generated by foundations; 21% by grants and contracts; 15% by membership fees; 5% by corporate donations; and 4% by training. Fifty percent of the council's expenditures were devoted to assistance; 30% to training; 10% to organizing labor/management committees; 5% to publications; and 5% to research. Thirty-five percent of the council's expenditures were spent providing productivity services to the manufacturing sector; 25% to government (including primary education); 20% to unions; 15% to the service sector; and 5% to higher education.

Within the last year, approximately 24 organizations were provided with assistance; 24 with education/training (100, if duplication is considered); and 15 others with assistance in organizing labor/management committees. Ninety-two percent of the council's expenditures were made in Michigan; 7% in the U.S., excluding Michigan; and one percent in the international sector. The council staffs 5 full-time professionals; 2 full-time support staff; and one EFT professional.

Organizational Techniques and Resources

Systems theory, industrial relations, and organizational and industrial psychology are the sources of most the ideas the council transfers to its clients. Data resources used by the council include the Harvard Business Review, the Wall Street Journal and other publications of the business press, abstracts from Manufacturing and Productivity Review, industrial relations and organizational psychology periodicals, and other publications.

The council is a member of the National Association of Labor-Management Committees and maintains personal and professional contacts with the Ontario Quality of Working Life Center in Toronto; the Northeast Labor-Management Committee in Boston; the U.S. Department of Labor; the Federal Mediation Center; the American Productivity Center; the Work in America Institute in Scarsdale, New York; and the Institute for Social Research at the University of Michigan. The council uses its own training packages.

To identify areas in need of productivity improvement for a client the council employs methods of visual and spoken appraisal (not written) and employee involvement through seminars and workshops. The council's diagnostic procedures take into account both the client's current situation and where the organization may be in 5-10 years. The council's procedures include initial exploration and commitment; initial policy planning and preparation; initial employee participation and involvement groups; expansion of employee participation and involvement groups; review and renewal; and institutionalization. The council works to change processes and does not provide written reports. When several areas of potential productivity improvement have been identified, the council works with the overall organization using labor relations/management philosophy.

Major Strengths of Organization

The major strengths of the Michigan Quality of Work Life Council in accomplishing its mission are its competent board and staff; the union support it enjoys from the United Auto Workers; and the existing economic environment in which "everyone knows they have to change."

Organization's Most Successful Project

The Bundy Corporation was having severe labor/management problems and requested assistance from the Michigan Quality of Work Life Council. The council analyzed the problem; prepared and completed 3 in-plant workshops; and set up an employee involvement program with staff and management. The project is ongoing and will involve many months of work.

Organizational Problems and Needs

The major problem facing the council is lack of funds; the council is running a \$100,000 deficit for 1983. The major problem the council has experienced in promoting its services is a lack of technical knowledge about what kinds of promotional brochures, flyers, and mailings to have. In implementing its program the council has had to contend with Section 8 (?) of the National Labor Relations Act which "potentially prohibits labor/management relations."

To achieve its growth plans the council needs funding, competent people with union backgrounds, and a network that would provide effective communications links. The council believes that its

opportunities would be greater if it were part of a network that supplied case studies, information, generic research, and ideas, in that order of priority. However, the council does not believe that its stature would be enhanced by national affiliation because national leaders in human relations are located in Michigan (Detroit area) and people want the job done locally, with local assistance, and expertise.

Organizational Changes Envisioned for the Next Five Years

In the next five years the council sees itself providing less assistance and publications and more education and research. Assistance efforts should be taken over by more Labor/Management Committees and more organizations should be involved. The council does not see the percentage of its annual expenditures devoted to the academic, manufacturing, service, union, and government sectors altering over the next five years.

The council plans to make more "grassroots" outreach efforts and establish more personal contacts, but increased funding is required for this. Productivity services that clients request but which the council does not provide include assistance with compensation plans; gain-sharing plans; improshare plans; safety and health consultation; and substance abuse and injury. New productivity services the council's center will require in the next five years include intensified supervisor training; new plant design and old plant redesign to foster work-team structures; and sociotechnical assistance to establish feedback loops.

Future Productivity Issues

The council believes that future opportunities for productivity organizations lie in the areas of adopting community action processes to improve both productivity and quality of work. The same mistakes should not be made as were made in the Industrial Revolution; workers should be involved.

The council does believe that standard training course modules are needed in the field of productivity, but they should be flexible and adaptable. The council sees a need for a national program to fund further research in productivity for case studies and to demonstrate progress to the public sector. The council also perceives a need for a national productivity office to provide statistical information, but not to serve as a quality of working life office. The national office could disseminate information, facilitate communication, and fund projects on an industry basis. The council strongly opposes national accreditation for productivity organizations.

The federal government can play a role in the productivity effort by providing information and modest grant support for consultation and training. The federal government could also serve as an information clearinghouse in the area of human relations education and sponsor cost-free conferences (except for travel expenses). It could also

provide funding for case studies and other related research in the area of human relations and seed money funding for human relations assistance.

The incentives required to create more interaction among productivity organizations are more time and money -- with "no strings attached" -- and cost-free conferences.

The council believes that hard technology using an optimal mix of human and technical factors will be important for increasing the productivity of the council's clients.

Ideal Productivity Organization

Given the opportunity to establish a new productivity organization, the council would design an organization that would focus 100% on human relations with a regional market, double the current staff size, and maintain the same skill and functions as at present.

The staff would include a union consultant, an organizational consultant, a training specialist, an editing and publication specialist, and a researcher.

Work in America Institute
700 White Plains Road
Scarsdale, NY 10583
(914) 472-9600

Major Orientation:
Human Relations

Size: Medium

President: Mr. Jerome Rosow
Vice President: Mr. Steven Smith

Primary Mission of Organization

The Work in America Institute, a national, nonprofit organization, was founded in 1975 for the purpose of promoting the advancement of quality of working life and productivity in the United States. With the support of business, unions, government agencies, universities, and foundations -- as reflected by the institute's board of directors, academic advisory committee, and sponsoring organizations -- the institute has pursued a broad variety of programs to achieve its goals. Over the past six years, the institute's policy studies, education and training programs, information resources, and publications have influenced the direction of public policy and brought to public attention the important workplace issues of the day.

Nature of Work of Organization

The Work in America Institute was established in 1975 and has both a formal charter and a board of directors. The board approves all institute programs and activities, especially its national policy studies. For 1982, the institute's budget was \$1.3 million, 35% of which was generated by product sales and membership fees, 35% by grants and contracts, 25% by corporate donations, and 5% by miscellaneous sources.

The institute devotes 100% of its expenditures to human resources issues in productivity.

Activities in this area break down in terms of expenditures according to the following percentages: 33% for publication, 33% for education, 33% for research, and 1% for other activities.

The quality of work life issues the institute addresses have application across all sectors, including the academic, manufacturing, service, union, and government sectors. The institute sells several thousand of its publications annually and does not do "hands on" consulting.

Seventy-five percent of the institute's expenditures were spent in New York State; 20% in the nation outside the State of New York; and 5% in the international market. The institute has 9 full-time professionals and 8 full-time support staff.

Organizational Techniques and Resources

The Work in America Institute is research and publication

oriented and does not transfer technology. It disseminates information on productivity and quality of working life. In addition to traditional sources of information, the institute relies heavily on the opinions and interests of its board of directors, sponsoring organizations and academic advisory committee members. The institute maintains membership in the U.S. network of quality of work life centers. The institute continually monitors hundreds of publications in the field of productivity to identify trends and state-of-the-art programs. Additionally, the institute receives input from its board of directors, sponsoring organizations, and academic advisory committee to determine the areas into which it should channel its energies.

Major Strengths of Organization

The greatest strength of the Work in America Institute is its strong management and its capabilities in examining state-of-the-art productivity and quality of working life programs within organizations with the purpose of disseminating information to interested parties regarding both program success and failure.

Organization's Most Successful Project

The institute considers its most successful productivity project to be its in-depth national policy studies (there are currently 4) which have been directed to urgent issues touching on the world of work. Each study has employed the talents and ideas of about 25 leaders from industry, labor, government, academia, and the not-for-profit sector as an advisory committee. Each study is supported by at least one major foundation. The institute reviews and abstracts the most important writings and case histories to determine state-of-the-art knowledge and experience.

Committee members discuss at a series of one-day conferences, special background papers, and later review draft chapters of the policy report and case studies of the most progressive programs.

The final policy study, directed to decision makers in all sectors of the economy, summarizes the committee's findings and offers clear cut policy recommendations based on actual case experiences. An Executive Summary digests the report for easier reading and broader distribution. A third document, the casebook, describes the experiences of organizations on which the recommendations are based. Following publication, a major press conference is held, followed by two or three public conferences. Press releases generate additional publicity.

Organizational Problems and Needs

The major problem facing the Work in America Institute is lack of adequate funding. The institute could use additional funding to improve its ability to disseminate information. Promotion of the

institute's publication activities is expensive. Although the institute mails between 100,000-200,000 catalogues annually, it would like to mail half a million or more. Cost precludes this.

The institute would also like to establish a data base to facilitate access to the vast amount of information which has been collected and catalogued and which is maintained manually.

The recession, with its related financial pressures, made it difficult to obtain philanthropy, sell publications, and market seminars, and membership services. To achieve its growth plans, the institute requires more financial support and better organizational awareness of the importance of the institute's work and mission.

The institute's opportunities would be greater if it were part of a network that actively shared generic research, case studies, and information, in that order of priority. The institute does not believe its stature would be enhanced by national affiliation, because it already enjoys an excellent reputation for the work it has done.

Organizational Changes Envisioned for the Next Five Years

During the next five years, the institute foresees no changes in the percentages of its total budget devoted to education, publication, and research. Its work will also continue to remain relevant to all sectors of the economy.

The institute currently does not plan to change or modify its services. The center's clients occasionally request hands-on consulting services, which are services the institute does not provide.

In terms of productivity services its clients will require, the institute believes there will be a need for more organizational awareness as to the value of employees as assets and resources. Training personnel for new technologies and retraining workers will be important issues. In terms of union environments, there should be greater emphasis on breaking down the barriers maintaining adversarial relationships.

Future Productivity Issues

In terms of future productivity issues, the Work in America Institute believes that opportunities will be available in the area of education, training, and retraining of the work force; research and dissemination of innovative, successful productivity and quality of work life programs; and development of measurement techniques to evaluate productivity improvements in the service sector. The institute does see a need for standard training course modules on productivity in terms of upgrading the general appreciation and understanding of the fundamental issues.

The institute does not see a need for a national program to fund further research in productivity. There is no need for another bureaucratic structure. Funds should be made available to existing

organizations in the fields that have credentials to warrant funding. There is a need for a national productivity office if it takes the form of an organization that could fund research. The national productivity office could serve as a funding source and monitor disbursements, but should not create its own internal programs. The institute favors national accreditation, depending on the factors involved in the selection process.

The federal government could establish a national agenda for productivity issues and then select productivity organizations (which are in place) to accomplish specific tasks. The federal government could also provide funding to these organizations. In the area of technology awareness, the federal government should publish and publicize information describing the importance of technology in improving the nation's productivity. The federal government can provide tax incentives to encourage technology development. With regard to management education, the federal government should publish and publicize information and statistical data relating to productivity which are not now available or which are unpublished.

In the area of management assistance, the federal government can serve as an information resource to direct organizations with questions to various network members experienced in the specific area of interest. Government-funded or subsidized training and retraining programs overseen by existing productivity organizations are possible activities in the areas of human resources research and education. Financial and health care benefits for unemployed workers and stipends for education, training and retraining are possible federal government activities in the area of human relations assistance.

The institute believes that more networking might break down some of the barriers between organizations that compete for funding. The institute also believes that the introduction of new technologies and new management techniques will be very important in increasing productivity in the future.

Ideal Productivity Center

If the Work in America Institute had the opportunity to set up a new productivity research organization, it would set up operations pretty much as they are at present. The main work that needs to be done in terms of productivity now is getting the message out that productivity is a national disaster and methods have to be developed to address it. The particular emphasis of the institute is on human resources. When human resource management skills are improved to the point that maximum benefits are being enjoyed from the value of each employee, productivity gains will follow. The institute's approach is to raise the awareness of government and business decision-makers about this issue, and it is not a short-term process. Support from upper and middle management, and from unions if they are involved, is required.

American Productivity Center
123 North Post Oak Lane
Houston, TX 77024
(713) 681-4020

Major Orientation:
Human Relations/
Management

Size: Large

Director of Public Affairs: Kathleen C. Sutton

Primary Mission of Organization

The primary mission of the American Productivity Center (APC) is to improve productivity and quality of work life in the U.S. The center's objective within this mission is to serve business, labor, government, and academia as a national resource offering leading-edge knowledge and assistance on productivity and quality of work life issues. The center's resources are concentrated in the areas of productivity and quality of work life management, white collar productivity, productivity measurement, labor/management cooperation and employee involvement, and the formation of national policy.

Nature of Work of Organization

The center was established in 1977 and has a formal charter and a Board of Directors that reacts to the center's plans and advises on strategic direction. The Board is also active in fundraising. Recently the center has begun to use part of its Board meetings for discussions of major issues affecting productivity and quality of work life.

For calendar year 1983, the center's budget was \$3.5-4 million, two thirds of which comes from contracts and product sales and one third of which comes from membership fees, foundations, and corporate donations.

The center concentrates in productivity management, labor/management relations, and employee involvement. Two-thirds of the center's activity in these areas occurred in providing assistance and education, and one sixth each was devoted to publication and research.

The center has worked primarily with organizations in the manufacturing sector, although a considerable number of services are provided to unions and service sector organizations. Over the year, assistance to firms has consisted of 175-200 instances of assistance in employee involvement, measurement, labor/management productivity assessment; 200 instances of providing educational services; distribution of publications on productivity to 350 organizations on a regular basis; 15 research projects; and 10 miscellaneous instances (e.g., teleconferencing) of aid. About 10% of the center's expenditures have been made in Texas, and about 90% in the U.S., excluding Texas.

The center employs 40 full-time professionals and 10-25 full-time support staff.

Organizational Techniques and Resources

In terms of the sources of the techniques it transfers to its clients, the center learns in the field and applies what it knows. The center acquires knowledge and expertise on productivity and quality of work life by researching, advising, and experimenting within a diverse group of organizations.

The center library houses a large collection of materials devoted specifically to productivity and related issues, including case studies, bibliographies, industry statistics, data base search capabilities, over 3,500 journals and books.

As for its relationships with other productivity organizations, the center sees itself as a linking pin through its Information Services Program, which provides research and reference services, including statistical data and bibliographies, to center staff and associates and business people, academics and others outside the center with an interest in productivity. The center also refers people to other centers and sometimes calls other centers for advice.

The center uses three packaged training programs that are distributed by the Learning Corporation of America: "Productivity Challenge," "Productivity Payoff," and "Employee Involvement: Issues and Concerns."

In identifying areas of potential productivity for clients, APC relies on its clients to set priorities. However, the center does assist its clients in integrating productivity issues into organizational planning processes. The client may choose to focus on long- or short-term issues. The center researches and identifies successful management practices and publicizes them through professional conferences and working research papers.

Major Strengths of Organization

APC has played a significant role in raising awareness of productivity issues in this country. The center considers not just labor productivity, but takes into account labor and capital, materials, and energy. The center has influence at the national level, and has highly experienced labor/management teams of consultants.

Because the center does not have just one constituency (e.g., labor, management, education, etc.), a third party approach is possible. Being in the middle allows the center to cross boundaries, gain access and serve as a mediator, negotiator, broker, or facilitator.

Organization's Most Successful Project

The center considers its most successful "project" to be its enormous contribution to educating and making people in this country aware of productivity and quality of work life issues. Second, the

center has built a knowledge base that has evolved just as productivity-related issues have themselves evolved. Third, the center has created a successful organization without having had a model it could follow.

Organizational Problems and Needs

When the center first began, it tried to be all things to all people, and consequently, had difficulty defining a specific direction. In the past 4 or 5 years, the center has matured and refined its focus. As with other non-profit organizations, a problem facing the center now is the slow down in the economy. In promoting its services, the center has also found that often people do not understand the comprehensiveness of the center's work. Some people think the center is a think tank. Others feel that it is simply a publications generator.

If the network of productivity organizations were strengthened, the center feels it would be easier to achieve its own goals. It is especially interested in learning about what other centers are doing and finding out where the center can get advice and assistance when it needs it. APC regards case studies as a more important source of information than general information and generic research.

To achieve its growth plans, the center requires continued funding from its present source (or from higher up) and experienced, seasoned people, especially organizational development executives.

Organizational Changes Envisioned for the Next Five Years

The center sees its expenditures being divided by the following percentages in five years: 30% for assistance and education, with the remaining 70% split evenly between publication, research, and other unspecified activities.

While not specifying any changes being planned in the services it provides, the center reports that it is always looking for ways to expand its services. Among services that clients request that the center does not provide, the center reports technical manufacturing assistance. APC does not concentrate work in this area. The center predicts that in the future its service sector work will increase as productivity issues related to knowledge workers come more into focus.

Over the next five years the center feels its clients will begin to realize that "total productivity" will depend upon tying whole systems together. Organizations will require integrated, ongoing productivity programs.

Future Productivity Issues

APC believes that the areas of future opportunity for productivity organizations include white-collar/knowledge workers; the service sector in general; aspects of small business; and national policy changes. The introduction of new technologies or improved

management techniques will be very important for increasing the productivity of APC's clients.

The center sees a need for standard training course modules on productivity and has designed its own course: Managing Productivity and Quality of Work Life. This is a 3-day seminar that provides an overview of the productivity basics for planning, managing, and measuring an improvement effort. The APC suggests that such courses be started in universities.

APC sees a need to develop information on specific topics, such as knowledge workers and the service sector. APC believes that funding further research in productivity is essentially private sector work.

A more complete understanding of the activities of the various centers would be required to create more interaction among productivity organizations, and APC wants to see the existing connections among the centers strengthened. Similarly, APC does not believe in national accreditation for productivity organizations, because the center draws on the skills of too many types of people and the requirements for productivity are too diverse.

If the national productivity office should be developed, the center believes it should serve as a forum for productivity organizations to report what the centers are doing, and also for the center to see what the government is doing. It should also be a clearinghouse, a resource center. In general, the federal government should take an increased interest in the areas of anti-trust laws and other national policy questions, including regulations, concerning productivity.

The APC is neutral and nonaligned, and believes that productivity improvement should be initiated, researched, and acted upon by the private sector. The federal government's role should be to look at what it's doing to inhibit productivity growth in the U.S.

Ideal Productivity Organization

In the future APC will work to strengthen its current services in quality and computer networking; will continue to be management, labor relations, and employee oriented; and will become increasingly involved in white collar areas.

Maryland Center for Productivity
and Quality of Working Life
University of Maryland
College Park, MD 20782
(301) 454-6688

Major Orientation:
Human Relations/
Management

Size: Small

Director: Dr. Tom Tuttle

Primary Mission of Organization

The primary mission of the Maryland Center for Productivity and Quality of Working Life is to encourage productivity improvements in public and private communities in Maryland through information dissemination, training, technical assistance, and research.

Nature and Work of Organization

The Maryland Center was established in 1977 and has both a formal charter and a board of directors. The charter calls for the make up of the advisory board to be as follows: 6 members from labor, 6 from management, 3 from state government, 6 from higher education, and 5 from professional associations.

In FY 1983 the center's expenditures totaled \$150,000. Sixty-four percent of the center's total budget comes from grants and contracts; 34% from the state; and 2% from membership fees.

Fifty percent of the center's expenditures were made in the human resources area and 50% in management. Twenty-five percent of the center's activities were devoted to assistance; 25% to education (training); 25% to publication; and 25% to research. Fifty percent of the center's expenditures are spent providing productivity services to the service sector; 30% to government; 15% to the manufacturing sector; and 5% to academic clients. Last year the center assisted 2,000 organizations by providing them with publications; 45-50 with training; 50 with assistance; and 30 with research.

Ninety percent of the center's total expenditures were spent in Maryland, and 10% were spent in the U.S., excluding Maryland. The center staffs 2 full-time professionals, 2 full-time support staff, and an additional equivalent full-time support person.

Organizational Techniques and Resources

The sources of the technology the Maryland Center transfers to its clients are Air Force research and access from other companies, centers, and libraries. Data resources the center uses include other centers' newsletters, the University of Maryland library, journals, and "fugitive" documents from business organizations, like IBM and Westinghouse. The center is a member of the National Council of Productivity Centers, is a member and is on the editorial board of Public Productivity Review; corresponds with the Georgia and Oklahoma

Productivity Centers; and has played an advisory role in the formation of the Participative Management Council.

The center has 3 basic training programs: quality circle facilitation training; productivity measurement; and training productivity managers. As part of all these programs the center uses standard packages drawing on material provided by the American Productivity Center, the Bureau of National Affairs, and IIE.

The center identifies significant new technologies or management practices that will impact its clients through journals and other publications; industry group feedback; advisory board input; the annual meeting of the National Council; newsletters; and its membership in the American Productivity Center.

To identify areas of a client's operation that might be in need of productivity improvement, the center uses semistructured interviews, surveys by faculty members, the Wilson Multilevel Management Survey, and "crude" productivity audits. The diagnostic procedures focus primarily on the client's current situation; relatively little is done in terms of providing strategic planning assistance. Even if the 5-10 year perspective were taken, the client would likely not receive different recommendations because the center does not deal with new technology (hardware) very much. Once several areas of potential improvement have been identified, the client specifies needs and provides guidance.

Major Strengths of Organization

The major strengths of the center in accomplishing its primary productivity mission are its state funding (\$60,000) which provides a sound base; its full-time staff; its committed board of advisors; its university affiliation; and the qualifications and capabilities of its staff.

Organization's Most Successful Project

The Maryland Center's most successful project was a meter reading department study for Washington Gas Light. University of Maryland faculty with backgrounds in operations research developed a linear programming model of the department. This was a successful diagnostic study looking at all aspects of operations.

Organizational Problems and Needs

The primary weaknesses of the Maryland Center are that it is short-staffed relative to its potential service level; it needs a larger funding base; it lacks visibility; it needs more political advocacy and recognition; and labor group involvement could be improved.

The major problem facing the center is defining its focus, deciding what the center can do best and marshalling its resources to those areas. The center has also experienced problems with its

ability to publicize its activities.

To achieve its growth plans the center needs to double its present budget, with the increase coming primarily from the private sector, and to obtain a personal computer to develop a data base for productivity information, quick access to information through networking with other data bases.

The center does believe that its opportunities would be greater if it were part of a network that supplied case studies, generic research, and information, in that order of priority. Also the center believes its local stature would be enhanced through national affiliation because of the greater visibility it would provide.

Organizational Problems Envisioned for the Next Five Years

The center does not believe that the percentages of its expenditures devoted to training, research, assistance, and publication will shift much over the next five years because the current balance has historically proven to be appropriate to the needs of the state. On the other hand, its services to the service sector will likely drop by 5%-10%, and its work with unions will increase by roughly the same percentage because this mix better reflects the economy of Maryland.

Among the changes planned in the services the center offers are modifications in the delivery process in order to use available staff to facilitate and coordinate other center resources. There are also plans to focus on industry associations in order to develop ability to respond to specific industry needs. Services which clients request, but which the center does not provide include "traditional" industrial engineering.

The center believes that its clients, with a specific focus on industry groups, in the next five years will require specific "how to" assistance. A Productivity Advisory Council is being formed with individuals in the Baltimore area who are representatives of manufacturing industries.

Future Productivity Issues

The center believes that future opportunities for productivity organizations lie in helping organizations blend technical, management, and human components of productivity (integration); providing specific industry assistance; and providing mechanisms for coordinated information flow (communications).

The center does perceive a need for standard course modules on productivity because they provide a good starting point to build from. Many topics could be developed. The center does not see a need for a national program to fund further research in productivity because we already know what to do, management knows what constitutes an effective organization. Delivery of existing knowledge is more important.

There is a need for a national productivity office to help

measure impact and to increase impact at the national level for government, labor, and industry. The national center could also serve a clearinghouse function. Clients could be national in scope and would prefer to deal with a national organization. The national center could also coordinate regional monitoring. The roles then for a national center could be advocacy, clearinghouse functions, information dissemination, and coordination of state centers. On the question of national accreditation for productivity organizations, the center believes that some central location of information on center activities would be helpful.

The center believes that the federal government should take an increased role in the area of labor/management cooperation; clearinghouse functions; and legislative matters. The extent of federal involvement in increasing technology awareness should depend on a number of factors. Larger firms should not be assisted. The government role should be significant for smaller firms. The government should also assume some responsibility for generating awareness of the impacts of technology.

In terms of technology development, the federal role should be primary in connection with technology related to national policy or goals, as in the case of defense. Technologies defined as "useful" should be supported. In the case of technology transfer, smaller firms should be assisted, with the Agricultural Extension Service serving as an appropriate model.

The federal government could possibly provide some funding support for management education, though efforts in this area might be more appropriate at the state or university level. The private sector should support university programs and be involved actively in them.

With regard to management assistance, the federal government could play an extension role, and labor should be represented in any activity. The private sector should share information. The federal role should be even-handed with respect to management and labor in educational efforts in the area of human resources. The federal role should be to encourage and stimulate but not regulate participative management.

The federal government should fund research in the human resources area and could play a role in stimulating cooperative research assuring interaction between researchers and potential users. In terms of human resources assistance, the federal role should be to publicize successes, disseminate information, and fund extension activities.

The incentive required to create more interaction among productivity organizations is the knowledge that standards could be developed to improve effectiveness of services. Electronic mail and networking might be appropriate vehicles to increase this interaction.

The center believes that the introduction of new technologies or improved management techniques will be important in increasing the productivity of its clients, with new technology being somewhat more important than management techniques. Other factors, such as tax

policies, will also affect productivity increase.

Ideal Productivity Organization

Given the opportunity to establish a new productivity organization, the Maryland Center would envision an organization which would devote its energies equally to the areas of human resources, management, and technical issues. The organization would be statewide in its market focus, with 8-10 people around the state, at least 4 of whom would be available for field activities. The staff would be a mix of industrial engineers, behavior specialists, and people with management and financial backgrounds. The staff would combine practical experience in business with a familiarity with government.

Utah Center for Productivity and
Quality of Working Life
Utah State University
Logan, Utah 84322
(801) 730-2283

Major Orientation:
Human Relations/
Management

Size: Small

Director: Dr. Gary B. Hansen

Primary Mission of Organization

The primary mission of this center is to serve as a source for innovative techniques to enhance productivity and the quality of working life among employees and unions in the region. The center also must create a clearinghouse of case studies, training curricula, resource packages, and other audiovisual and printed materials for organizations interested in starting up quality of working life programs. In addition, the center provides professional assistance to firms requiring third-party intervention to plan, develop, implement, and evaluate productivity and quality of working life activities. Finally, the center monitors and reports regional activities and has attempted to generate a network of active organizations pursuing quality of working life objectives.

Nature of Work of Organization

This center was established in 1976 and has neither a formal charter, an advisory board or a board of directors. For FY 1983, the center's budget was \$130,000, 55% of which was provided by Utah State University; 30% by grants and contracts; 10% by product sales; and 5% through membership sales.

Half of the center's expenditures occurred in the area of human relations and half in management. Activities in these areas broke down in terms of expenditures according to the following percentages: 40% for assistance to clients; 40%, educational efforts; 10%, publication; and 10% for research.

Of the center's total expenditures, 45% were spent providing productivity services to the manufacturing sector, 35% to government, 10% to the service sector, 5% to unions, and 5% to academic institutions. Assistance to firms included 10 instances of direct assistance; 2-3 conferences per year to educate firms on productivity issues; 3 research projects; and 520 instances of providing publications requested by firms. Seventy-five percent of the center's expenditures were made within Utah; 20% was spent in the U.S., excluding Utah; and 5% was spent in international productivity efforts.

The center employs two full-time staff members: one professional and one support person. The center's staff, in terms of equivalent full-time workers, includes 3 EFT professionals and 1.5 EFT support persons.

Organizational Techniques and Resources

The primary sources of techniques the center transfers to its clients are engineering researchers and professors in technology areas on campus; technical journals and data banks; and personal contacts with individuals involved in productivity work. The center lacks the resources to make systematic searches to identify technologies and management practices for clients. The center exchanges ideas, techniques, and materials with the American Productivity Center, the U.S. Department of Commerce, the U.S. Department of Labor, and productivity centers in Oregon, Maryland, and Oklahoma. The center currently uses nominal group technique, objectives matrix, and productivity coordinator training programs.

To identify areas of potential productivity the center primarily responds to client requests and focuses almost exclusively on the client's current situation. Its recommendations are usually geared to solving immediate problems in areas where the greatest opportunities exist for improvement or where the need for action is most urgent.

Major Strengths of Organization

Being a part of Utah State University lends credibility to the center and assures clients that the center will be an ongoing effort. The center is also relatively small and can therefore be very flexible and marshal resources quickly to address problems.

Organization's Most Successful Projects

A manager at a turkey processing plant who had attended one of the center's productivity workshops contacted the center about a problem with high labor turnover. The plant employed between 400 and 500 workers and needed to stabilize this problem immediately.

The center convinced the firm's board of directors that a Scanlon plan would provide a solution to their problem. The center fashioned the plan; set up the required standards; and adapted the concept to this industry through innovative means.

After a year of data gathering, the center installed the plan. Over the first two years, the plan has generated savings of 10%-25% per month. Having gone as far as possible with increased utilization of labor, the center plans to work with the plant on introducing new technology.

In a second successful project, the center participated in the development and implementation of a Statewide Productivity Program in Utah. The governor appointed a task force to look at productivity in state government. The task force developed plans, identified where productivity expertise existed in state agencies, invited speakers, and suggested the creation of a state coordinator for productivity.

The task force's report was accepted by the governor and 3-4 state agencies have started to implement some of the findings. The

Department of Transportation started a program of "participation groups" modeled after quality circles.

The center serves as a productivity resource in this effort.

Organizational Problems and Needs

Among the most significant problems faced by the center is its lack of funding and other resources. This lack of funding limits the center's ability to respond to opportunities; forces the center to divide its modest resources among a number of different projects; makes it difficult for the center to maintain continuity in its assistance efforts; and prevents the center from achieving critical mass.

The center also reports problems with visibility and image. For example, productivity is only one element in the university's overall mission. It is difficult to involve specialists from other campus units in the center's work because few incentives, apart from a recent I.B.M. proposal, are in place to make such activities beneficial for them.

The center also notes the difficulty of negotiating the tricky area of activity between the business and academic communities and the lack of a coherent mission with regard to the center's responsibilities concerning consulting and education.

As far as promoting its services, the center again notes that it has a visibility problem on campus. In addition, while it would like to publish a newsletter, the center lacks the necessary funds to do so. Also promoting the center's services more effectively would result in a greater demand, which the center does not have the resources to handle.

In addition to staff and funding, the center believes the development of a productivity communications network that would prevent centers from expending scant resources on work that has already been done elsewhere is essential to its growth plans. The network should supply information on generic research, case studies, and other types of information. A national affiliation would help provide credibility for regional centers as well as raise national awareness of productivity issues.

Organizational Changes Envisioned for the Next Five Years

The center foresees its expenditures being divided by the following percentages in five years: 30% for assistance; 30% for education; 20% for publication; 20% for research. The center foresees an increased demand for research and publications. Such efforts both supply needed information and increase the center's visibility.

The center foresees the client sectors it services breaking down as they currently do: 45% for the manufacturing sector; 35% for government; 10% for the service sector; 5% for unions; and 5% for academic.

While the center does not have any current plans to modify the services it offers, it foresees clients requiring the following new types of productivity services in five years: interfirm productivity comparisons; productivity measurement; productivity audits; and more systematic methods of transferring technology. Clients can implement specific techniques, but cannot afford to conduct research and development.

Future Productivity Issues

The center believes that the major opportunities for productivity centers exist in technology transfer and disseminating information to small and medium-sized organizations; human resources; and assistance to state and local government agencies.

The center sees a need for standard training course modules on productivity to provide some basic productivity approaches; to involve a number of productivity organizations in evaluating and validating modules; and to provide a means of productivity measurement.

The center also sees a need for a national program of research in productivity to encourage productivity measurement and audits and the development of new products from generic and other types of research. Incentives that would create increased interaction among productivity organizations include meetings at which new knowledge or products could be obtained and increased funding that would enable more contacts.

While it is not convinced about the need for national accreditation, the center recognizes that many organizations are involved in productivity that are not qualified to be. National accreditation would help establish standards and an overall mission.

A need exists for a national productivity office that would provide a focal point for productivity efforts and a framework for linkage and the sharing of information. However, it is important that such a center not develop into a large organization. Such a center could also assist with publicity, networking, data base access, national policy guidance, and research.

The introduction of new technologies and management techniques will be very important for increasing the productivity of clients because these activities require a great deal of time to identify problems, identify needed techniques, and effect transfer of these methods.

In general, productivity organizations do not have a good sense of their mission. They have arbitrarily pursued funding in a variety of areas and, consequently, have spread themselves thin. They lack a main thrust.

A gap exists in the current productivity structure, and what is missing is a catalyst, a force for change. This function is both educational and informational. The federal government cannot solve this problem, but it can assist others in filling this gap. It can provide a focus for publicity about productivity and should serve as a

clearinghouse for information for organizations involved in productivity. It can encourage the private sector and provide indirect support for the development of a productivity delivery system.

Ideal Productivity Organization

In its ideal form, this productivity center would be an integrated center that worked in the areas of human resources, management, and technical assistance. Its market would have two segments: small and medium-sized firms requiring assistance and local and state government agencies whose resources are being pinched. The staff would consist of 5-10 people, including 2 engineers, 2 management specialists, 2 human resources specialists, and an information specialist to head an information resources center. Means would also be put into place to establish a link with other schools on campus.

Oklahoma Productivity Center
Oklahoma State University
Stillwater, OK 74078
(405) 624-6055

Major Orientation:
Management

Size: Small

Director: Dr. Scott Sink

Primary Mission of Organization

The primary missions of the Oklahoma Productivity Center are to conduct research and development in the general areas of productivity measurement and productivity improvement; to monitor and evaluate developments in productivity measurement and improvement techniques occurring internationally as well as nationally; to analyze, evaluate, and interpret productivity measurement and improvement techniques for managers of organizations in the Oklahoma region; and to develop and provide an effective range of services, programs, and extension activities for organizations in the Oklahoma region.

Nature and Work of Organization

The Oklahoma Productivity Center was established in 1976 and has a prospectus. The center is recognized by the university, but not by the State of Oklahoma nor by legislative mandate. Its "charter" is from the dean. The center does not have an advisory board or board of directors at this time, but the formation of such a body is under consideration.

For 1982 the center's total expenditures were between \$250,000 and \$500,000, 60% of which was generated by grants and contracts; 35% by extension, training, development, and in-house briefing activities; and 5% by product sales (newsletters, computer programs, films/tapes, etc.). The center's activities are equally divided among the human resources, management, and technical areas. Similarly, the center's activities are equally divided among assistance, education, publication, and research.

Last year, the center assisted approximately nine firms with technical assistance (quality management, computer applications, and productivity management), in addition to performing about 50 energy audits; approximately 400 with education (public courses, media packages, in-house briefings, and seminars); and approximately 400 through providing publications (newsletter). The center's research is generic; it does not assist firms directly.

Sixty percent of the center's expenditures are spent providing productivity services to the manufacturing sector; 25% to the service sector; 10% to academic clients; and 5% to government. Sixty percent of the center's expenditures were spent in the U.S., excluding Oklahoma; 30% were spent in Oklahoma; and 5% internationally. The center staffs three equivalent full-time professionals and one

equivalent full-time support person. The center employs no actual full-time staff.

Organizational Techniques and Resources

Academic sources are the main sources of the processes the Oklahoma Productivity Center transfers to its clients. As for data resources, the center maintains reciprocal agreements with other centers, subscribes to all the productivity journals, and scans the environment for relevant material.

The center has a reciprocal agreement to share information with all major productivity centers in the U.S. and other countries. The center also attends the national network meetings to maintain and establish contact with other productivity centers.

The main training package the center uses is a 3-day short course --The Essentials of Productivity Management: Measurement, Evaluation, Control and Improvement. Over 500 managers have been trained over the past two years. The center also offers numerous public short courses, in-house management briefings, and American Productivity Center media packages.

To identify new processes to transfer to its clients, the center continually pays attention to opportunities that may emerge and bring new techniques to the fore. Center staff read, listen, and talk to people about what they are doing. The diagnostic procedures the center employs to identify areas of a client's operation in need of productivity improvement include a multi-factor productivity measurement model and strategic planning and productivity audit models that are in the process of being developed. Most of the center's procedures do have a strategic component that takes into account where the client is likely to be in the future. The center walks the firm through a strategic planning process, setting goals and objectives. For a small business, the range is 2-5 years; for a large business, 5-10 years. The focus in either case is on performance. Once several areas of potential productivity improvement have been identified, managers will tell the center where their specific weaknesses are.

Major Strengths of Organization

Because the Oklahoma Productivity Center is located in the industrial engineering department of Oklahoma State University, the center has a very strong background in technology and management. Its balance in these areas is one of the center's strengths. The center can call on exceptional faculty who are national leaders in their field, has a broad experience base, and has worked with 20-30 major firms.

Organization's Most Successful Project

The development of the Productivity Action Team Process is the Oklahoma Productivity Center's most successful project. The PAT

program design is a hybrid in that aspects of a variety of techniques, programs, processes, and methodologies have been integrated into the program design. The program as outlined appears to provide management with a dynamic way to: 1) better utilize employees' talent, 2) create improved goal congruity between management and employees, 3) enrich the jobs of employees, 4) improve cooperation between functions, 5) identify and attack roadblocks to productivity that have been known to exist, but that people have done nothing about, 6) create decision making and motivate action based upon group consensus rather than on an autocratic or consultative style of decision making, 7) develop employees by allowing them the opportunity to become active participants in organizational problem solving, and 8) improve productivity by creating a motivation to improve as a result of involvement and commitment.

To date, over 30 organizations of varying type and size have been involved in the development research and process. What has emerged is an involvement strategy and technique which has been designed for American organizations, managers, and employees. The process in its early stages evolved independent of the quality circle phenomenon. During the last several years, the process has incorporated certain "appropriate" features of the Japanese-developed quality circle program.

Recent research and development have revealed that some American managers view the Productivity Action Team Process as significantly different and better than quality circles. However, a few managers have failed to see significant differences and improvements and have therefore, opted for a slightly modified version of quality circles.

Organizational Problems and Needs

The center desires to grow at a controlled rate, but has not engaged in the "politics game." The center tries to define its problems as opportunities. Letting people know what the center is and what it does is one of the challenges the center faces. It also needs to try to get to know its clients better; the center newsletter has been helpful in this effort.

The main problem the center has to overcome is the "socialistic" programs that have been perpetuated by state and federal agencies. An example of such a program is the free service offered by vo-tech schools.

In terms of promoting its services the center has consistently underestimated the amount of time that must be devoted to effective promotion.

To achieve its growth plans the center needs staff, equipment (in the robotics and computer areas), and support funding for overhead and administration.

The center is part of an informal network that shares case studies, information, and generic research, in that order of priority in the center's standpoint. The center believes that its stature

would be enhanced by national affiliation and, in fact, has been. However, national affiliation doesn't have much recognition now. More press out of Washington is needed.

Organizational Changes Foreseen for the Next Five Years

The center sees no major changes in its dedication of equal amounts of energy in the areas of education, publication, research, and assistance. Similarly the percentages of the center's activities devoted to the academic, manufacturing, service, and government sectors is unlikely to change over the next five years. The center has no current plans to modify or change the services it provides.

In the next five years the center believes its clients will require new productivity services in the areas of employee involvement, productivity measurement, basic management services (basic industrial engineering, basic quality control, etc.), automation in general (robots, computers, etc.), and handling job displacement.

Future Productivity Issues

The Oklahoma Productivity Center believes that employee involvement (white and blue collar) through productivity action teams; quality; software productivity measurement packages; training and development; robotics; strategic planning for productivity programs in firms; and energy and water management will be areas of opportunities for productivity centers in the future. The center does see a need for standard training course modules on productivity, and as an example cites a course at Oklahoma State entitled Productivity Measurement and Improvement. The center is undecided about the need for a national program to fund further research in productivity. Regional and state centers do not need another national center to "coordinate" them. A national program could fund some research on topics such as the role of the human factor in productivity improvement and tax incentives for companies that want social sciences applied research (management development, quality control circles, etc.).

The center sees no need for a national productivity office. A decentralized productivity system would be better. The centers do not need another center to coordinate them, but to make their work easier. The focus should be on a national system, regional in orientation. An existing agency in Washington should chair or head the network (the Department of Commerce, for example); a new entity should not be created. The role of a national productivity office should be facilitating the network and regional center activities. The office should not play a role in doing things, not even a clearinghouse function. The idea of a decentralized, computerized clearinghouse should be explored.

The center is somewhat in favor of national accreditation for productivity organizations and suggests that perhaps this project

could come up with a minimum set of qualifications for a regional center.

The federal government should increase its role in the area of productivity by facilitating the activities of the productivity network. The federal government should have no role in the areas of technology awareness; management education; management assistance; human relations assistance; or human relations education. The federal profile should be high in the area of technology development; moderate in the area of technology transfer (federal labs, transfer of knowledge to centers); and active in providing support and incentives for human relations research.

Productivity centers would interact more if they could meet once every three quarters, which would require funding of some kind. The federal government would identify the viable centers and provide them with seed money for the trip to the Los Angeles conference, personal computers, secretarial support, etc. The regional centers definitely need some discretionary funds. Specific project research might be funded through the National Science Foundation, for example.

The center believes that the introduction of new technologies and improved management techniques will be essential to increasing the productivity of its clients.

Ideal Productivity Organization

Given the opportunity to establish a new productivity organization, the Oklahoma Productivity Center would establish a center with the same staff size, skills, and functions, and areas of activity as the current center.

Productivity Center
U.S. Chamber of Commerce
1615 H Street, N.W.
Washington, D.C. 20062
(202) 463-5620

Major Orientation:
Management

Size: Large

Director: Dr. John Volpe

Primary Mission of Organization

The primary mission of the Productivity Center of the U.S. Chamber of Commerce is to influence national policies and legislation in the area of productivity, to provide education and training information to members and other interested parties, and to perform in the area of labor/management productivity improvement.

Nature and Work of Organization

The Productivity Center was established in 1978 and has neither a formal charter or a board of directors. In 1982 the center spent \$70,000 for a research project entitled "Education and Work." The center's budget is generated by general membership fees to the U.S. Chamber of Commerce. The National Chamber Foundation, an affiliate of the U.S. Chamber, assists in the funding of major research projects such as the one listed above.

The center's primary expenditures are in the area of management (75%). The center's activities involve educational services to chamber members and legislators; these activities sometimes take the form of conducting and disseminating, the results of secondary research.

Of the center's total time, 37.5% is devoted to providing productivity services to the manufacturing sector; 37.5% to the service sector; and 25% to retail and commercial establishments (other than manufacturing) that belong to the U.S. Chamber. The center also provides educational assistance to 2,500 state and local chambers.

The geographical distribution of the center's expenditures varies, depending upon the research and information-type services involved. Some expenditures normally are generated by an international component. The center staffs one quarter-time professional, one half-time professional, one full-time professional and two support persons. Additional chamber staff economists and attorneys are drawn into various work programs of the productivity center on an as-needed basis.

Organizational Techniques and Resources

Visits to and contacts in Japan are one source of the information the center transfers to chamber members. The center uses readily available data gathered and disseminated by government agencies and

private organizations such as the American Productivity Center and the Washington Coordinating Council on Productivity. The center has sponsored joint projects and maintains a correspondence with the American Productivity Center in Houston; and coordinates trips to Japan through the Japan Productivity Center.

The center is currently not using any training packages, though the previous director had acquired video-taped presentations on productivity.

Major Strengths of Organization

The center's major strength in accomplishing its primary productivity mission is the base represented by state and local chambers of commerce.

Organization's Most Successful Project

The center regards the trips it has arranged to Japan as its most successful project. The trips have been very well-received by those who have made them.

Groups of 15 or 20 people make these trips; small groups are the rule for greater effectiveness. These groups tour Japanese factories and businesses and are able to learn management techniques first-hand from the Japanese. These trips are coordinated with the Japan Productivity Center.

The center is also pleased with the results of its study in the area of education and work, which involved primary research to enhance the ability of primary and secondary school students to read, write and compute, and the development of a business community "strategy document" to assist local school boards in implementing this information.

Organizational Problems and Needs

The center at present is understaffed and underfunded. Thus, the director is unable to spend more time in productivity work. The center's opportunities would be greater if it were part of a network that supplied generic research, information, and case studies, in that order of priority.

Organizational Changes Envisioned for the Next Five Years

The center sees itself phasing out its research component and devoting itself fully to educational activities. In general, the center perceives productivity becoming less of a priority issue at the federal level.

The center plans no new thrusts or expansion of its activities. No changes are anticipated in the manner in which services are offered, and therefore it is assumed that the recipients of the activities will remain the same. The Productivity Center was recently

subsumed into the Chamber's Council on Trends and Perspective, a longer-range, issues-oriented business community "think tank."

Requests for information or assistance that the center cannot supply are referred to the American Productivity Center in Houston. The center does not anticipate any greater emphasis on productivity services in the near future.

In the next five years clients will require responses to their requests for information on methods, research, etc., on topics related to productivity. Chamber members will need continued education on productivity issues.

Future Productivity Issues

The center believes that the major opportunity for productivity organizations in the future lies in the more effective dissemination of productivity information to users in business and industry. The center's director believes that too many productivity organizations are in existence today, duplicating work whose importance, at times, can be questioned.

Based on the type of requests it gets, the center does not perceive a need for standard training course modules on productivity.

The center does see a need for a national program to fund further research in productivity. The U.S. has not defined an appropriate policy on productivity and, consequently, public policy research issues would be a fertile area for such an effort. The center also sees a need for a national productivity office to provide better coordination and communication among the various productivity centers around the nation. The center had no reaction to the question of national accreditation for productivity organizations.

The Chamber's position is that business capital formation is the key to improving productivity, and the center would support federal initiatives to provide further tax policy incentives to improve capital formation.

The center believes that in the areas of technology awareness, technology transfer, management education, management assistance, human resources education, human resources research, and human resources assistance, the federal government's role should be secondary. For necessary areas, such as defense, in the area of technology development, the federal government should be involved; otherwise the federal role should be secondary.

The center believes that better ways must be found to coordinate all productivity centers at the national level. Communication needs to improve and coordination is required for greater effectiveness.

The center also believes that the introduction of new technologies and improved management techniques will have a very significant impact on increasing productivity.

Ideal Productivity Organization

If the center had the opportunity to establish a new productivity organization, it would emphasize management-related activities and have one or two full-time staff members who are familiar with policy issues. These staff members would be involved with tracking and influencing legislation. At present, the Productivity Center is in a response mode, rather than a knowledgeable role.

Georgia Productivity Center
Georgia Institute of Technology
Atlanta, GA 30332
(404) 894-3404

Major Orientation:
Management/Technical

Size: Large

Director: Mr. Rudy L. Yobs

Primary Mission of Organization

The primary mission of the Georgia Productivity Center is to contribute to the economic development of the state, region, and nation by providing assistance, education, and applied research for the improvement of public and private sector productivity.

Nature and Work of Organization

The Georgia Productivity Center was established in 1961 and was formally chartered by the State of Georgia in 1975. The center does have an advisory board that was established in cooperation with the statewide business association and is composed of industrial managers from throughout Georgia. The expenditures for the center for FY 1983 were \$5.8 million, 80% of which was generated by grants and contracts and 20% by the State of Georgia.

Seventy-five percent of the center's total expenditures were spent in the technical area and 25% in the management area. Sixty percent of its expenditures occurred in the course of providing technical assistance; 15% in education; 15% in research; and 10% in publication. Last year the center provided technical assistance to 1,600 firms; educational services to 450; publications to 14,000; and research services to 40.

Eighty percent of the center's total expenditures are spent providing productivity services to the manufacturing sector; 10% to government; and 10% to the service sector. Sixty percent of the center's expenditures were spent within the State of Georgia; 15% occurred in the U.S., excluding Georgia; and 25% in the international sector. The center staffs 110 equivalent full-time professionals and 35 equivalent full-time support staff. The actual full-time staff consists of 40 full-time professionals and 20 full-time support staff.

Organizational Techniques and Resources

The sources for the technology the Georgia Productivity Center transfers to its clients include Georgia Tech staff and faculty specialists; industry practice (trade sources); and data bases. Data resources used by the center include the Georgia Tech library; holdings in the center's Basic Data section; external computerized data bases; and Georgia Tech staff and faculty.

The Georgia Productivity Center has established relationships with productivity centers at the University of Maryland, Oklahoma State University, the Illinois Institute of Technology, Penn State, and Oregon State University. The Georgia center exchanges information on measurement, interfirm comparisons, quality control, and the use of extension methods, among other issues, with these centers.

The center currently only uses internally developed training packages (e.g., on robotics) and could benefit from the exchange of training packages with other centers. It is a goal of the Georgia Productivity Center to develop a systematic means of identifying significant new technologies or management practices that will affect its clients. Work toward this goal has been conducted with internal funds, but is still in its very early stages.

The center uses standard business accounting techniques to identify areas of a client's operation in need of productivity improvement. The primary emphasis of the center's diagnostic procedures is on the client's immediate situation, with some projections of up to 3-5 years. Clients are typically not interested in longer-range projects; they want immediate help. Once several areas of productivity improvement have been identified for a client, the center concentrates its assistance where industry's need and support are available and where the needs match the center's capabilities.

Major Strength of Organization

The major strengths of the Georgia Productivity Center are being part of a large, recognized organization (the Georgia Institute of Technology) with diverse resources to draw upon; the fact that all productivity activities are grouped under one managerial and budgeting umbrella; the center's charter from the State of Georgia; its full-time, dedicated staff; and the flexibility of its programs and operations.

Organization's Most Successful Project

The organization's most successful continuing project is its Poultry Industry Assistance Project. Since 1973 the center has been active in conducting engineering research tailored to agricultural applications, and most of this research has been directed at the poultry industry, Georgia's leading agribusiness. Under the guidance of the Georgia Poultry Federation, programs have been designed to solve difficult technical problems. All of the projects undertaken thus far have addressed areas which have been identified as directly or indirectly affecting production efficiency and profitability.

Rather than using the traditional laboratory setting for research, the center's programs stress practical applications of research results. Typically, center researchers work jointly with a farmer or industry member to acquire data and apply results.

Hardware-related projects have resulted in new equipment items which are actually in use at plants and farms today.

The primary source of funding for these much needed research programs has been the Georgia legislature. However, growing financial support has been received in recent years from federal and industrial sources interested in furthering the search for answers to the many technical problems facing today's agricultural industries.

Research areas include: solar heating, wood heating, energy conservation, computerized energy systems, heat recovery, preventive maintenance, noise abatement, water and wastewater control, employee productivity, and processing mechanization.

Organizational Problems and Needs

Two weaknesses the center reports are the lack of a well-defined constituency and the lack of public recognition and visibility. The Georgia Productivity Center is a function of another organization: Georgia Tech's Engineering Experiment Station. Consequently, the center has no individual identity or resources. Visibility is low and recognition accords to the parent organization. A strong industrial constituency has not been generated for the center itself, though the center does share the client base of the Georgia Institute of Technology.

The center reports no legislative or constitutional prohibitions that have to be overcome. The legislation that does exist favors the center. The major problems and obstacles the center has encountered in promoting its services include its lack of organizational identity; the fact that its services are diffused and are not crisply and visibly packaged; and the difficulty of quantifying its results.

To achieve its growth plans, the center requires some discretionary funding to develop new methods and the establishment of mechanisms for exchanging methods, programs, etc., with similar centers in order to achieve wider markets and economies of scale. The center believes its opportunities would be greater if it were part of a network that supplied generic research, information, and case studies, with generic research and market opportunities being particularly important. The center believes its stature would be enhanced by national affiliation because of the degree of recognition it would entail.

Organizational Changes Envisioned for the Next Five Years

Over the next five years the center foresees a mild decline in the degree of technical assistance it provides, with corresponding increases in its educational and applied research activities. The center also foresees some growth in its work with service industries. While the center reports that it is not considering any changes in its basic approach to the productivity services it provides, some changes will take place over the next five years in terms of refining and improving the center's services. The center's clients occasionally

request services in some aspects of management and human resources which are not particularly emphasized at the Engineering Experiment Station. The center believes its clients will require more systematic ways of identifying areas of productivity need and productivity improvement and more cost-effective ways of achieving these improvements.

Future Productivity Issues

The Georgia Productivity Center believes that future opportunities for productivity organizations lie in the following areas: application of new management methods in business and government; development and application of new techniques to improve quality and control costs in manufacturing; the use of advanced communications techniques to counsel and instruct users in achieving the ends just described, as well as others; and the aggregation of user needs into markets that can be addressed in cost-effective ways. The center does perceive a need for standard training course modules on productivity because there needs to be some standard and accepted body of practice in order to improve acceptance, creditability, and recognition for productivity efforts.

The center also sees a need for a national program to fund further research in productivity. There is a need to encourage a recognized body of practice, as well as to develop new methodologies. Direct federal funding, however, is not the complete answer; industry and other institutions need to be involved. There also is a need for a national productivity office to provide a national focus for a very diverse set of productivity activities. Such an office could provide a national focus for a network of more or less similar productivity centers and provide leadership without bureaucracy. The center believes that formal accreditation for productivity organizations is currently impractical, but centers could become recognized as sources of methodologies which have credibility, thus achieving at least part of the quality objective.

There should be a recognized federal policy -- a national goal -- to improve productivity. Evidence of this policy should take the form of a central office to help develop a network of productivity centers which would be the real delivery mechanism for technology and methodologies.

To create more interaction among productivity organizations would first require an acceptable model of what a productivity center can or should be. This would provide a goal to work towards. Then, a funding pattern needs to be developed involving government and private sources. Once a model and a funding pattern are established, interaction will follow. The center believes that the introduction of new technologies and improved management techniques will be important for raising the productivity of the center's clients, but not more important than the use of existing technologies and practices.

Ideal Productivity Organization

Given the opportunity to establish a new productivity organization, the center would create an organization that maintained its own current focus on management and technical issues. It would also maintain the same basic functions: extension, education, and applied research. The center would be funded by a combination of basic (state) support and the ability to develop sponsored research. The center's size would depend on many variables, but 20-25 people would be an ideal starting point.

Oregon Productivity Center
Oregon State University
Corvallis, Oregon
(503) 754-3249

Major Orientation:
Management/Technical

Size: Small

Director: Mr. Glenn H. Felix

Primary Mission of Organization

The mission of the Oregon Productivity Center is to develop more effective ways to improve productivity and to guide organizations in the use of such practices.

In pursuit of its mission, the center responds to requests for information; publishes a monthly Productivity PRIMER; promotes productivity awareness with talks delivered to business, education, government, and civic organizations; imparts practical knowledge and specific skills through in-house and open-enrollment short courses; assesses the potential of improvement within organizations through its Productivity Diagnostic; defines specific paths to improvement through implementing an in-house Objectives Matrix system; upgrades management decision making through Productivity Interfirm Comparison Programs; assists in implementing full-scale, employee-involvement programs; and creates and perfects productivity improvement methods.

Nature and Work of Organization

The Oregon Productivity Center was established in 1980 and has an advisory board responsible for policy and advisory matters only. The center's expenditures for the base year 1982 were \$225,000 (\$325,000 in 1983). Eighty percent of the center's total budget derives from grants and contracts; 10% from corporate donations; 5% from foundations; and 5% from product sales (training materials).

The center's productivity activities are equally divided between management and technical efforts. Forty-five percent of the center's total expenditures are devoted to assistance; 20% to education; 20% to research; and 15% to publication. Seventy percent of the center's expenditures are spent providing productivity services to the manufacturing sector; 15% to the service sector; 10% to government; and 5% to unions. Last year the center assisted approximately 1,700 organizations with publications; 600 with education; 150 with assistance; and 20 with research. Eighty percent of the center's expenditures were spent in Oregon and 20% in the U.S. (Pacific Northwest), excluding Oregon. The center employs 3 full-time professionals, one full-time support person, and the equivalent of .25 EFT support staff.

Organizational Techniques and Resources

The center's professional staff maintains close relationships with the Productivity Center Consortium (participant); the World

Confederation of Productivity Services (President); the Asian Productivity Organization (consultant); the Japanese Management Association (participant); and AIIE (member). The training packages the center now uses include Interfirm Comparison; Objectives Matrix; and Productivity by Objectives.

To identify significant new management practices the center interviews and speaks with business leaders throughout Oregon, pursues continuing education for its staff, and interacts closely with its clients. To identify areas of a client's operation in need of productivity improvement, the center employs the Productivity Diagnostic it developed. The Diagnostic concentrates on the client's current situation and includes a fixed scenario of operations, a sequence of actions, that every client should adhere to. It starts with increased awareness, followed by the diagnostic to assess the climate.

The Diagnostic is an instrument for securing suggestions about how an individual company can improve its productivity. Workers are asked to express their views about the effectiveness of the company's communications, working arrangements, operating practices, product quality, adequacy of supervision, and concern of management. For each category, the employees are urged to give suggestions about how conditions can be changed to improve their individual performance and the performance of their department. In effect, the diagnostic is a driven suggestion system in which employees are motivated to think about productivity and become involved in company-wide programs to improve performance.

Then the productivity measurement system is installed. Gainsharing approaches may be next, and then the entire process is integrated. The objectives matrix, in which upper management assigns weights to organizational criteria, helps identify and establish priorities among potential productivity improvements in a client's operation.

The Objectives Matrix designed by the Oregon Productivity Center is a state-of-the-art means for measuring productivity. With a matrix format individual tasks are subordinate to the entire department or work group. Feedback centers on the effectiveness and efficiency of all concerned. Moreover improvement is the expectation -- not the achievement of some standard level of performance. Continued striving for better ways is recognized as a "style of operation." Finally, with the matrix format, all monitors of productivity are combined and weighted such that workers and supervisors are privy to a much better defined production mission. Also, they and management are provided with a single number to monitor from period to period -- one which feeds back overall results.

Major Strengths of Organization

The center's strengths are the innovative approaches it develops to improve productivity and its rather modest goal of perfecting one approach at a time, getting it out, and not trying to go in too many directions.

The center also has an extremely diverse staff. Because the center approaches problems from the engineering and technical standpoint, it has less competition than it would if it were dealing directly with human resources issues.

Finally, the ability of the staff to communicate its findings in books, articles, presentations, and short courses is very strong.

Organization's Most Successful Project

The greatest contribution the center has made to the area of productivity is in the development of productivity objectives. The second is the productivity interfirm comparison program which is a practical application.

Productivity Inter-Firm Comparison is a simple technique whereby companies compile information on their own operations, forward it to an impartial third party, and shortly afterwards, receive feedback on how their performance in areas like output, energy consumption, waste, safety and turnover compares with that of other firms that have reported similar information. The greatest value of the program is in unearthing inefficiencies that insidiously have become acceptable, and in some instances, even laudatory performance, when quite the contrary is true.

Productivity by objectives is the umbrella service which the center provides. It would not be too strong to say that this approach will revolutionize productivity in this country.

Organizational Problems and Needs

One of the center's primary problems is marketing its services effectively. The center lacks a systematic marketing plan or strategy. As for legislative or constitutional prohibitions the center has had to overcome, the center almost lost its EDA grant because the Governor of Oregon felt that it cost the state too much money to manage federal dollars. The governor eventually did agree to approve the grant.

Rather than promote its own services, the center would like to have more resources to raise general awareness about the national productivity problem.

If the center is to grow, it needs more funding. The center believes its opportunities would be greater if it were part of a network which supplied information; case studies; generic research; and techniques, in that order of priority. The center does not believe that its stature would be enhanced by national affiliation, because it already has a good local reputation.

Organizational Changes Envisioned for the Next Five Years

The center does not envision significant changes in the percentages of its activities devoted to assistance, education,

publication and research, because EDA will determine the center's priorities as long as it is the source of funding. Efforts in the area of education and publication might increase slightly and assistance might correspondingly decline.

The center sees the percentage of its expenditures devoted to the manufacturing sector declining to 40% and its activities in the service sector (health care service) nearly tripling to 40%. Its expenditures providing services to government will likely increase to 15%.

As for new services the center plans to offer, overhead analysis is a technique that is currently being developed. The center will also be putting on a series of small business short courses throughout the state.

Among the productivity services that clients request but that the center does not provide, are individual help in terms of assistance to solve a particular problem; start-up assistance; and technical assistance on a particular aspect of machinery, wastewater, or other concerns that the center is unable to handle.

The objectives matrix the center designed is among the productivity services its clients will require over the next five years. Services designed for the service and government sectors will also be needed during that period.

Future Productivity Issues

The major movement in the productivity area in the future will be productivity centers working with firms to implement improvements that are already in existence but which the firms currently are not aware of.

Productivity centers will be active in research (new and better ways to improve productivity); in raising awareness and focusing attention on productivity issues; in serving as clearinghouses for information for businesses on a state or regional level; and in serving as impartial third parties in establishing interfirm productivity comparisons.

The center does see a need for standard training course modules on productivity because there is a two to four hour common productivity message that could apply to most productivity programs or short courses. People need to receive a consistent message that emphasizes the correlation between productivity and employment, real wages, standard of living, international competition, and quality.

The center sees a need for a national program to fund further research in productivity because, in general, productivity centers are not qualified to perform purely technical activities. What is needed is a balance of hard industrial engineering and behavioral considerations.

The center sees a need for a national productivity office to coordinate activities and provide guidance and attract attention to productivity issues. The center should not be located in Washington,

D.C., and should provide the opportunities for cooperation between the Departments of Commerce and Labor. It would also be good if the national center had a mission that differed from that of the regional centers it supported so that it did not itself become a regional center.

The national productivity office could coordinate results at local centers through conferences and information exchanges. It should also publicize the national publicity crisis and draw attention to productivity issues. Eventually the center should be supported by government and industry, although it will likely have to be completely supported by government at first. The center does not believe that productivity centers need to be accredited nationally.

The federal government should take a more active role in increasing productivity awareness and funding and coordinating the work in interfirm productivity comparisons.

Productivity research in the private sector needs to be supported in the way that research for defense is. Generic research is essential and will not be generated by individual organizations. The federal government should also get involved in leading the effort to retrain the American work force.

In the area of technology awareness the federal government should fund a clearinghouse and increase cooperative research for some of the more exotic industries that are taking shape. The actual work in this area should be handled by universities and productivity centers, with the government providing the funding.

In the area of technology development, the government needs to encourage cooperative research by easing companies' concerns about anti-trust issues. In the area of technology transfer, a great deal of potential would be realized if funding were made available to make companies aware of resources and technology. In the area of management education, more emphasis is required to prepare small businesses to operate.

The government should not do anything active in management education or assisting management, but it should fund the efforts of productivity centers. The government should pull some of its money out of business schools and put it in organizations more closely aligned with industry and yet still oriented toward education. Funding should go to real world programs with strong input from industry.

The government should also fund some activities in the area of human resources education. Some funding should be provided to improve management skill in small businesses. The government needs to fund more research in the area of human resources assistance, but it should be applied research. In education, research and assistance, productivity centers are ideally suited to serve as resources for this country to get us out of its productivity crisis.

The major incentive that would create more interaction among productivity organizations is the conviction that organization among the centers existed. The nation may need to be divided up by regions

to relieve the concern that centers have about another center coming in from out of state and taking away their business. More meetings should take place in alternating regions.

While the center believes that the introduction of new technologies will be important for increasing the productivity of its clients, the introduction of new management practices will likely be more important.

Ideal Productivity Organization

Given the opportunity to establish a new productivity organization, the center would create one with a focus of 40% devoted to technical issues, 30% to human resources, and 30% to management issues. A technical base is the most important factor, but the other two areas cannot be neglected. Other technical factors the center has to deal with are quality aspects not related purely to machinery. Among the management considerations are strategic planning and tactical implementation. And the key human resources issue is involving workers and getting them to cooperate with the objectives of management and in the creation of a suitable quality of work life.

Texas Center for Productivity and
Quality of Work Life
Texas Tech University
Box 4320
Lubbock, TX 79409
(806) 742-1537

Major Orientation:
Management/Technical

Size: Medium

Director: Dr. Barry A. Macy

Primary Mission of Organization

The purpose of the Texas Center for Productivity and Quality of Work Life is to strengthen the State of Texas' and the United States' private and public enterprise system, by creating, identifying, and supporting programs which inspire organizational effectiveness (i.e., productivity, product or service quality, costs, etc.), and the quality of work life for employees.

The Center has three primary objectives: (1) To help enhance the level of productivity and, therefore, job security within the State of Texas and the United States; (2) To help raise employees' quality of work life in Texas and the United States; and (3) To assist organizations in both the private and public sector to become more effective in providing lower costs and higher quality products or services through joint worker/management involvement in organizational change projects.

The Texas Center helps starting and existing organizations to become healthier and more prosperous, and will help them expand. It will also provide assistance in attracting new organizations to the State of Texas and elsewhere, leading to more and better jobs, higher incomes, increased state revenues, and reduced burdens on unemployment and welfare funds.

Nature and Work of Organization

The Texas Center was established in 1979 and does not have a formal charter. It does, however, have an independent Advisory Board composed of representatives from management, labor, state government, professional associations, and institutions of higher education. The Advisory Board provides input and direction to the center by reviewing major policy and operating standards; strategic plans and progress; major capital commitments; and operating results.

For 1982, the center's expenditures were between \$500,000 and \$1,000,000. Sixty-six percent of the center's budget comes from grants and contracts; 10% from product sales; 10% from foundations; and 14% from the Texas legislature. Forty-five percent of the center's expenditures occurred in the area of management-related productivity work; 35% in the technical area; and 20% in the transfer of work innovations. Activities in these areas broke down in terms of

expenditures according to the following percentages: 40% for action research (classroom, seminars, training); 30% for assistance; 15% for education; and 15% for publication.

Sixty percent of the center's expenditures were spent providing productivity services to the manufacturing sector; 25% for the service sector; 5% for academic clients; 5% for unions; and 5% for government. While stating that the numbers are essentially "meaningless," the center broadly estimates that in 1982 it provided 400 instances of assistance, including 125 to Shell oil plants; about 11,900 educational contacts, consisting of in-house and classroom seminars with about 100 firms represented per course; 5,000 instances of providing publications; and 100 instances of research.

Thirty-five percent of the center's expenditures were made within Texas; 60% were made in the nation, excluding Texas; and 5% were international. The center staffs about 11 equivalent full-time professionals (and about 9 EFT graduate research assistants) and 4.5 EFT support staff.

Organizational Techniques and Resources

The sources of the technology the Texas Center transfers to its clients are other organizations from the public and private sector, other global centers, private consultants, and the center's own members and associates. The data resources the center uses include the center's reference room, which contains 1,000 case studies from the U.S. and the world, 7,000 articles and books, 15,000 reference cards, and 500 information sources from the center itself.

The diagnostic procedures the center employs to identify areas in need of improvement for clients include management audits, socio-technical system audits, and key stewardables. These procedures take into account the client's current situation and the outlook for 3-5 years. If the 5-10 year outlook were taken, clients would receive a different set of strategies. Once areas of productivity improvement have been identified, the center determines the focus of its assistance after considering the client's system, awareness and knowledge.

The center uses training packages in the areas of work innovation; CAD/CAM factories; socio-technical systems; union/management cooperative relations; organizational effectiveness measurement; quality circles; and lessons and learnings from productivity programs. The Texas Center corresponds with over 500 worldwide productivity organizations and is a member of the national productivity consortium, which includes 34 centers in the U.S., only 10 of which are active.

Major Strengths of Organization

The major strengths of the organization in terms of accomplishing its primary productivity mission are that it is multidisciplinary in nature and able to diagnose and implement productivity and organiza-

tional design efforts based on past results of other organizations and centers.

Organization's Most Successful Project

The center believes that there are too many criteria for success for any single project or small group of projects to be judged as its most successful.

Organizational Problems and Needs

Among the most significant problems faced by the Texas Center are its lack of sufficient funding; its need for more competent staff in additional disciplines; its need for a greater amount of interchange with government and global world leaders; and the lack of state, regional, and national networks.

In general, with regard to productivity organizations, the Texas Center perceives a lack of coordination among active centers; not enough cross-fertilization and sharing of work; a lack of national direction; and too much empire building among the centers. The center has used only "word of mouth" to promote its services.

To achieve its growth plans the center needs more competent multidisciplinary professionals capable of working inside organizations and increased funding from the Texas legislature, contract clients, and grants from a national consortium for productivity. The center's opportunities would be greater if it were part of a network that supplied basic and applied research; information based on that research; and case studies with lessons and learnings from the research. The center is unsure if its stature would be enhanced by national affiliation.

Organizational Changes Envisioned for the Next Five Years

The center believes that the next five years will see an increase in its activities in the areas of assistance and research, because these activities go hand in hand. The center's term for it is "action research." The center also foresees increased activity in the service area and in its work with unions and government.

The center has no current plans to modify or change the services it provides. The service that clients request, but that the center does not provide is awareness training. The center believes that its clients will require productivity services in the areas of new plant design; office automation; robotics; CAD/CAM; socio-technical systems; and gainsharing over the next five years.

Future Productivity Issues

The Texas Center believes that major opportunities for productivity centers exist in the areas of new plant design; office automation; robotics; CAD/CAM; socio-technical systems; gainsharing; a

broad conception of productivity to include hard and soft technology transfer; the diffusion of work innovations; and an increased emphasis on basic research and development.

The center believes that standard training course modules are needed on a variety of important and vital subjects within the broad area of productivity. There is a national need for a program to fund basic and applied research and development efforts in a global definition of productivity with the goal of establishing a consortium to identify 10 or 15 major national needs. The program could fund national, regional, and state centers for 3-5 years to start the coordination, funding 2-3 centers per identified need. For a U.S. consortium, about 2,000 professionals would be loosely connected in project fashion.

The center perceives a need for a national productivity consortium outside the federal government but funded by the federal government. People from 27 different agencies now responsible for productivity would come into one, focusing on such issues as technology transfer, innovation, and international trade.

The center sees little or no value in the notion of national accreditation for productivity organizations.

The national productivity office should have as its role the integration and coordination of global productivity efforts on a national scale; funding the 3-5 year start-up of the national/regional/state centers mentioned earlier; and the dissemination of information through states, not the national center.

The federal government should play a role in creating a multi-disciplinary basic and applied research and development consortium funded by the federal government but outside the federal government and in creating third party entities between the public and private sectors to work on public needs like, for example, the antitrust laws.

An "expanding pie," in terms of money, knowledge, and information dissemination, would be necessary to create a greater degree of interaction among productivity organizations.

The introduction of new technologies and improved management techniques will be very important in increasing the productivity of the center's clients. Change over the next 10 years will occur at a much more accelerated rate than over the past 10 years.

Ideal Productivity Organization

Given the opportunity to establish a new productivity organization, the center would fashion a State of Texas research and development consortium which would consist of pooled multidisciplinary professionals who would organize and administer university basic and applied research and development in order for university scholars of the public and private sector to focus their efforts on issues and needs related to the state's economic growth.

This consortium would be funded through state-appropriated funds and be governed by a board of directors. It should be composed of

members from the State University System, the private university sector, and other private and public representatives. The Texas Center has prepared a proposed plan for the Texas legislature which could be used at the national level for the U.S. consortium. Each state would provide money for that state to tackle the 10-12 big problems identified for the year.

Texas Hospital Association Statewide
Productivity Center
6225 U.S. Highway 290 East
P.O. Box 15587
Austin, TX 78761
(512) 453-7204

Major Orientation:
Management/Technical

Size: Large

Director: Dr. Karl L. Shaner

Primary Mission of Organization

The goal of the Statewide Productivity Center is to accelerate the implementation of productivity enhancement techniques in hospitals. The Center evaluates and implements managerial concepts and techniques structured to increase the productivity of the health care industry. The collective statewide approach employed by the Productivity Center tries to encourage participation by hospitals to implement managerial enhancement techniques of their own.

The initial six management techniques implemented by the productivity center are: management engineering; management reporting; shared collection service; health manpower resource allocation; best methods; and group purchasing.

Nature and Work of Organization

The Statewide Productivity Center was established in 1975. While it does not have a formal charter, it does have a "Task Force on Future Directions." For 1983, the center's budget was over \$1 million, 80% of which was provided by the sale of services and 20% of which derived from membership fees (productivity reporting service, etc.). The center was started in 1975 with an HEW grant.

The center expends 40% of its budget in providing management assistance; 40% in providing technical assistance; and 20% in the area of human relations. Activities in these areas broke down in terms of expenditures according to the following percentages: 45% for assistance (including management engineering, management reporting, and group purchasing); 30% for education (including the activities of the educational services group and the health manpower resource allocation program, which increases awareness about health careers); 15% for research on hospital productivity; and 10% for publication, including the dissemination of information about better work practices ("best methods").

Of the center's total expenditures, 95% were spent providing productivity services to the service sector and 5% for academic clients. Within the last year, the center assisted more than 560 hospitals by providing publications and provided educational assistance in 250-300 instances. The center does not keep records of instances of brief technical assistance, but estimates that it answers approximately 20 questions regarding productivity per week.

The center estimates that 95% of its budget was spent within the State of Texas and 5% was spent in the U.S., excluding Texas. The

center employs 50 full-time professionals and 50 full-time support staff.

Organizational Techniques and Resources

The primary sources of the technologies the Statewide Productivity Center transfers to its clients is cooperative exchange with other state hospital associations and related organizations. The data resources the center draws on include publications and its own expertise. Examples of workshops the center conducts as part of its training activities include the Fire Safety Evaluation System Workshop, the Hospital Food Service Directors Spring Workshop, and the Quality Assurance Mini-Workshop. The center interacts with the American Productivity Center and the Hospital Management Systems Society, and communicates with hospital associations in all the other states.

The center uses high "cost-per-case" numbers to identify hospitals in need of help, and some of its procedures take into account where the client will be in three years. Determinations about where to concentrate assistance are made on the basis of highest-cost-per-case information. The center studies the upcoming needs of its clients, who are patients.

Major Strengths of Organization

The major strengths of the center are the strong support it enjoys because 90% to 97% of the hospitals in the state are members; its strong experience; consisting of almost 15 years of background across the board; and its success in applying sound engineering management techniques in an area where this kind of practice is not well accepted.

Organization's Most Successful Project

The center notes that each of its departments would have a different answer to this question.

In its management and technical area, the center cites its Veterans Administration Medical Centers Resource Utilization Evaluation System as its most successful project.

This system makes it possible to compare the "product" costs of one medical center to the "product" costs of other centers. The product of each center, defined in terms of a standardized output measure called a "synthesized case," is determined by considering factors such as type and number of services provided, out-patient services, educational programs, etc. The system is simple to use, but the methods used to develop it are quite complex.

The advantages of the system are that it provides a management tool for executive decision-making; it establishes national or regional norms to which individual hospitals can be compared; it creates a means by which hospitals can be compared to each other; it enables the quantification of cost differences between hospitals offering different services, education and outpatient services; it

identifies the areas which are making specific hospitals exceed the norm; and it can be readily used on a regional or statewide basis or among a specific group of hospitals.

Basically, the system provides health management with the opportunity to be on the offensive rather than the defensive where the efficiency of their respective organizations is concerned. Most important, the system allows hospitals to explain legitimate cost variations to their boards, their communities, planning bodies, state agencies, and the federal government.

Organizational Problems and Needs

The most significant problem faced by the Statewide Productivity Center is its own lack of effectiveness in publicizing and marketing. The major obstacle in promoting hospital productivity services is the federal government's cost-reimbursement systems (medicare, medicaid, etc.) which provide no incentive to reduce costs. Also the center's clients are becoming increasingly competitive, and it is becoming highly difficult to obtain information from them. Most of them do not like to respond to questionnaires.

Money is the primary resource the center needs to achieve its growth plans. The center feels its opportunities would be greater if it were part of a network which supplied information, generic research, and case studies on productivity work, in that order of priority. The center's stature would not be enhanced by national affiliation because it is a statewide center only.

Organizational Changes Envisioned for the Next Five Years

The center currently has no plans to modify or change the services it provides over the next five years, nor does it foresee changes either in the types of services it provides or its client base. The center believes that its Task Force on Future Directions has successfully kept its service activities up to date.

New productivity services the center's clients will require in the next five years include alternatives in computer software; tie-in with the center's productivity management reporting system, which is used to determine the level of productivity in hospitals and how that level can be increased; and "electronic blackboard" educational services.

Future Productivity Issues

The Statewide Productivity Center foresees opportunities for productivity organizations in the future in the areas of assistance in selecting computer software; "electronic blackboard" educational services; and productivity measurement/reporting by computer.

The center sees no need for standard training course modules on productivity because it is too early to standardize productivity. The center also does not see a need for a national program to fund further research in productivity, unless the program is nongovernmental and/or

funded by seed money only. The center does see a need for a national productivity office that should not be funded by the federal government and suggests an alliance of trade associations. The role of a national productivity office would be to serve as a clearinghouse for information and educational programs.

Because individual industry and trade associations are doing a good job, the federal government should not involve itself in increasing technology awareness. Similarly, the private sector should be primarily responsible for management education, management assistance, human relations research, and human relations assistance. The federal government can play a 50/50 role in technology development, and can participate in human relations education in its role as the social conscience. The federal government should also look into wage and hour laws. The current laws, which are geared toward firms that operate one shift, limit hospital flexibility in staffing.

The Statewide Productivity Center is opposed to national accreditation because it cannot envision anything good that accreditation would provide. Accreditation assumes "stability" and no stability now exists in the productivity area. To create more interaction among productivity organizations, it is necessary to convince the centers that they have nothing to lose through interaction.

The center believes that the introduction of new technologies or improved management techniques will be of little value in increasing the productivity of its clients. Gaining a better understanding of current technologies and techniques is more important.

Ideal Productivity Organization

If it were establishing a new productivity organization, the center would arrange things pretty much the same as they are now. It would definitely not increase activities in the area of human relations because other consultants are very active in this area.

Manufacturing Productivity Center
Illinois Institute of Technology
10 West 35th Street
Chicago, IL
(312) 567-4800

Major Orientation:
Technical

Size: Large

Director: Dr. Keith E. McKee

Primary Mission of Organization

The Manufacturing Productivity Center (MPC) is dedicated to helping U.S. industry increase its productivity. The center makes information available to industry and encourages interaction among companies. MPC provides the impetus for individual companies to increase their productivity and, further, helps to increase the productivity of vendors and material suppliers.

MPC believes that productivity is the responsibility of individual companies -- they succeed or fail based on their own efforts. The center provides participants with information and motivation to help direct their efforts toward productivity gains.

Nature and Work of Organization

MPC was established in 1977, has no formal charter, and has multi-client programs for which clients meet quarterly to provide the center with advice. MPC's expenditures for 1983 were \$6 million. Ninety percent of the center's total budget was generated by contracts and grants, 5% by product sales, and 5% by membership fees. Seventy-five percent of the center's expenditures occurred in the technical area, with an additional 20% in management, and 5% in human resources.

In terms of these activities, 50% of MPC's total expenditures were spent on research, 25% on assistance, 15% on education, and 10% for publication. The Illinois Institute of Technology has an interactive instructional television network which offers a series of short courses tailored to meet the specific educational needs of today's industry.

Ninety-two percent of MPC's total expenditures are spent providing productivity services to the manufacturing sector; 2% to academic clients; 2% to the service sector; 2% to unions; and 2% to government. In the last year, MPC assisted approximately 200 firms with direct assistance; about 1,000 with educational matters (through the Illinois Institute of Technology's interactive instructional television network); about 600 firms with publications (a monthly publication called "Manufacturing Productivity Frontiers"); and about 150 with research.

Ninety-five percent of MPC's total expenditures were made within the U.S., but outside Illinois, and 5% were made internationally.

MPC is an umbrella organization; the Illinois Institute of Technology Research Institute has about 2,500 employees. MPC itself

has a staff of approximately 200 equivalent full-time professionals and about 50 EFT support staff.

Organizational Techniques and Resources

MPC uses 63 computerized data bases; its own library, which includes 100 periodicals and 2,000 books; the campus library of the Illinois Institute of Technology; and government resources.

In terms of the relationships MPC maintains with other productivity centers, it co-sponsored a project with the American Productivity Center and makes about 2 referrals to APC per week; it conducted a water jet project with the Georgia Productivity Center; it is a member, along with APC, of the American Productivity Management Association; and it published a book with the Utah Center. MPC publishes notices for all center meetings; announces and reviews publications; and publishes articles by staff members of other centers.

MPC uses training packages in the following areas: project management; introduction to computer programming using BASIC; introduction to microcomputer programming; introduction to exporting for business; industrial robots; distributed processing systems; computer communication networks; software design; database management systems; knowledge engineering; error control coding; upgrading power system equipment; office information systems; image information systems; and others.

MPC draws upon every known resource to identify new technologies and management practices. The "Frontiers" publication is especially helpful in this effort. To identify areas of a client's operation in need of productivity improvement, the center performs an on-site audit. MPC believes that companies rarely have precise knowledge of what their problems are. The audit provides the company with a list of recommendations, and the company and MPC then pick out the areas of concentration. MPC's diagnostic procedures do take into account where the client may be in 5-10 years.

Major Strengths and Organization

The major strengths of MPC in terms of carrying out its primary productivity mission are its long-term relationships with industry; its many staff members who are ex-industry people; its knowledge of manufacturing technology; and its method of taking human factors and management issues into account while working with manufacturing issues.

Most Successful Productivity Project

MPC regards its multi-client programs as its most successful "project." Over the years, multi-client programs -- where both the costs and results are shared by a group of companies -- have proven among the most useful techniques for transmitting technology throughout industry. Examples of MPC's programs include the Manufacturing Productivity Center Multi-client Program; the Laser

Multi-client Program; the Automated Integrated Manufacturing Systems Multi-client Program; the Squeeze Casting Research Program; and the Flexible Automated Manufacturing Technology Evaluation Center.

MPC's greatest visibility has come about through its monthly publication, "Manufacturing Productivity Frontiers."

Organizational Problems and Needs

MPC believes that its visibility is not as good as it should be and that its staff does not currently possess all the skills that could be useful. The major problems facing MPC are getting its clients to do what is recommended and insufficient funding. Because MPC is totally private and receives no money from the state, it has not had to overcome any legislative or constitutional prohibitions in implementing its program.

The major problem MPC has encountered in promoting its services is the myriad people in "productivity" -- consultants, etc. -- selling themselves as productivity experts.

To achieve its growth plans MPC needs more money. MPC believes that its opportunities would not be greater if it were part of a network that supplied generic research, information, or case studies. Its local stature would not be enhanced by national affiliation because it is well-known nationally already.

Organizational Changes Envisioned for the Next Five Years

MPC does not see the percentages of its activities in the areas of assistance, education, publication, and research shifting much during the next five years. Nor does it envision significant changes in the percentages of services it provides to the manufacturing sector and its other much smaller client bases. The center does have some plans to modify or change the services it offers.

Services that clients request that MPC does not provide include quality of work life requests, which are almost always referred to other centers; measurement requests, which are usually routed to the American Productivity Center; and construction productivity, an area in which MPC has done very little. MPC believes that its clients will require a better understanding of the role of technology in improving productivity over the next five years.

Future Productivity Issues

MPC believes that the opportunities for productivity organizations in the future consist of technology in general; lasers; and management areas (indirect areas). MPC does not see a need for standard training course modules because standard productivity training is negative; it forces companies into a preconceived mold.

MPC does perceive a need for a national program to fund further research in productivity. As a nation, the U.S. lacks knowledge of measurement. The federal government has some data, but does nothing with it. The government should collect more detailed information on

companies. Our industries are not provided information they need to compare themselves to their peers here and in other countries.

The center also sees a need for a national productivity office because people from outside the U.S. have trouble knowing where to go with their productivity questions, and the nation's productivity efforts need a focal point, but not a funding source or a money-passer. A national center could serve as such a focal point and perhaps play host to meetings of the centers. The leadership position should be similar to that of the Controller General. The person in charge of the national center should be permitted to say whatever he or she desires to say, without regard for the current federal administration. On the other hand, MPC believes that accreditation for productivity organizations is "nonsense."

The federal government should increase its role in the area of productivity measurement, as described earlier, and anti-trust issues. MPC sees no role for the federal government in the areas of management education, management assistance, or human resources assistance. However, a valid federal role exists in increasing technology awareness; in technology development or innovation (perhaps providing a test bed to show a completely automated factory); in exposing technology that has been developed by the government; in human resources education, perhaps through the U.S. Department of Labor; and in human resources research.

MPC doubts that the resources of a state or regional center can do much in terms of improving productivity through technology. The regional centers, which have "soaked up" some big companies, are not referring many people to national centers.

MPC thinks that the introduction of new technologies or management techniques will be important to increasing productivity. Productivity improvement that does not change something is false.

MPC believes that the current network among productivity centers is not so bad, and thinks that it does a good job of describing its own work. Everyone knows now that productivity is a problem; what is needed is solutions. MPC has observed little protectionism among centers. The lack of material worth networking is perhaps a more serious problem. Measurement is one of the few items that has been profitably networked. A consortium of productivity centers would be useful if it could provide overviews and guidance for firms seeking help -- that would be its ideal function.

Ideal Productivity Organization

Given the opportunity to establish a new productivity organization, MPC would design a center that would address human resources, management and technical issues. The center would also attempt to add productivity work in two areas: mining and construction. These are definite gaps in the productivity area.

State centers are useful only if there is enough money to run them.

Pennsylvania Technical Assistance Program
Pennsylvania State University
University Park, PA
(814) 865-0427

Major Orientation:
Technical

Size: Medium

Director: Mr. Leroy Marlow

Primary Mission of Organization

The Pennsylvania Technical Assistance Program (PENNTAP) functions as the middleman in the marketplace of technology, not as a buyer or seller, but as a go-between for Pennsylvania firms that need help with technical problems and the vast technology resources that can produce answers and solutions.

In this role, PENNTAP's technical specialists use their professional experiences and backgrounds to (1) learn and define the needs of each organization requesting assistance, (2) provide from their own knowledge and from public and private technical resources suggestions and options tailored to the need of the particular organizations, and (3) present this data or information in ways that can be easily understood and, therefore, applied in a practical manner.

The center responds to users' needs by assembling the most current resources and tailoring them to a particular problem so the user is in a position to make a decision.

Nature and Work of Organization

PENNTAP was established in 1965 and has both a formal charter and an Advisory Council, a group of fifteen executives from the private sector who actively engage in helping to guide and plan program activities. In 1982, PENNTAP's total expenditures were \$450,000. Sixty percent of the program's total budget is generated from grants and contracts and 40% from university funds.

Eighty percent of PENNTAP's expenditures occur providing services in the technical area; 15% in human resources; and 5% in management. All of PENNTAP's expenditures occur in the area of assistance. Fifty-seven percent of its expenditures are spent providing productivity services to the manufacturing sector; 13% to government; 9% to the service sector; 7% to the academic sector; and 13% to churches, libraries, and individuals. Last year the program provided assistance to 1,395 organizations. All of PENNTAP's expenditures were made in the State of Pennsylvania. The program employs 14 full-time professionals and 3 full-time support staff.

Organizational Techniques and Resources

Staff capabilities, Pennsylvania State University faculty, technical libraries, private labs, government, the federal laboratory consortium, the network of centers, and many data bases are the sources of the technology the program transfers to its clients. The

data resources PENNTAP uses are the wide variety available to the program at Penn State. PENNTAP maintains membership in NAMTAC, the NPC network, the U.S. Chamber of Commerce, and the Technology Transfer Society, and exchange communications with the NPC network and the U.S. Chamber of Commerce.

PENNTAP is using training packages in the areas of electric motor efficiency, microprocessors, preventive maintenance, and a wide range of industrial education courses. The program uses the suggestions and recommendations of its Advisory Council; "skull sessions" with industry groups, conference calls, and the relationship between technical specialists and advisory council members to identify significant new technologies and management practices that will impact its clients.

The diagnostic procedures the program employs to identify areas of need within clients' operations vary from project to project. Because most small businesses do not have the luxury of a long-term plan, the diagnostic procedures tend to focus on the client's short-range, immediate situation. The program's recommendations might differ if long-term considerations were taken into account. When several areas of potential productivity improvement within a client's operation are identified, the program's technical expertise determines where assistance will be concentrated. Clients are directed to other resources for assistance beyond PENNTAP's own capabilities.

Major Strengths of Organization

The major strength of PENNTAP is its credibility, part of which derives from its affiliation with Penn State, but part of which also reflects the care the program has devoted to matters of communication and confidentiality. Professional staff at PENNTAP are hired not only for their technical skills but for their ability to communicate effectively with clients and potential clients. They have to deliver programs, seminars, speeches, and make presentations. PENNTAP believes that every aspect of its assistance should be tailored to the specific client's needs and followed through to the greatest possible extent.

Another strength is that the climate both in the State of Pennsylvania and at Penn State is geared toward a greater recognition of service activities.

Organization's Most Successful Project

A meter manufacturer asked PENNTAP for information on the chemical composition and the size of particulates in crude oils. The company was concerned with the efficiency of blades and filters after long use in its measuring devices because inaccurate measurement of oil flow is costly.

With PENNTAP's information in hand, the firm began to make changes it said would ultimately create new business. The firm said this would protect existing jobs and mean higher manpower requirements. The company commented on the project evaluation form: "Your rapid response, with pinpoint accuracy on our information

request was extremely useful. . . I ordinarily don't 'gush' like this, but we got exactly what we needed." The manufacturer expects \$550,000 in new business in each of the next five years as a result of innovations implemented with the information PENNTAP provided.

Organizational Problems and Needs

One problem the center reports is funding. Another problem is attracting high caliber people who can provide consistent service. The major problem is consistent funding at an adequate level to meet the needs of business and industry in Pennsylvania.

Turnover in company personnel is the major problem PENNTAP has encountered in promoting its services. The program staff will build up contacts and relationships with individuals within a firm who, when they leave, may be replaced by people who may not know about PENNTAP. Centers have to be careful about the extent to which they publicize themselves. Theoretically, the more publicity and more advertising, the more demand, but if demand escalates to the point that you cannot meet it, the result is trouble. PENNTAP watches that very carefully because the last thing the center wants is for someone to call and ask for assistance and for the program not to be able to provide it.

Consistent funding, private sector recognition, and internal university recognition and involvement are what PENNTAP needs to achieve its growth plans. PENNTAP believes its opportunities would be greater if it were part of a network that supplied information and case studies, in that order of priority. The program also believes its stature would be enhanced through national affiliation because its visibility might be improved and the national group might serve as a sounding board for ideas and opportunities.

Organizational Changes Foreseen for the Next Five Years

PENNTAP does not believe that its complete commitment to the area of technical assistance will shift over the next five years because the need for and value of technical assistance is increasing. PENNTAP's services have a high impact on the economy and recognition has been growing of the value of technical assistance in improving business.

The program believes that the amount of service it devotes to the manufacturing sector will increase by 5%-6% due to the growth of technology.

PENNTAP has no current plans to modify or change the services it currently provides. PENNTAP does not really receive requests for productivity services that it cannot provide. The program concentrates on technical issues, but maintains a working relationship with the Department of Labor Studies at Penn State and some of the human resources-related problems the department tends to work with.

In terms of new productivity services its clients will require over the next five years, the computerized approach is increasingly becoming dominant in industry and business, but associated with that development will be social/human questions that arise. How should management interact with today's work force? How should they

communicate with workers on some of the things computers are doing and will do. The quality of work life issues will be important in answering some of these questions.

Future Productivity Issues

The areas of future opportunities for productivity organizations will be in the area of technology, which will be the major factor impacting productivity. People-oriented issues will also be significant. PENNTAP sees no need for standard training course modules on productivity. The program also does not see a need for a national program to fund further research in productivity, though a need for more research does exist. There is a need for a national productivity office to provide a central focus on the tremendous opportunity to improve productivity.

The office could potentially represent 30 organizations. If it consisted of people who were committed to providing service, whether management or technical, the national office would serve a great need. PENNTAP has positive feelings toward the idea of national accreditation, but requirements would vary a great deal from one organization to another.

The federal government should work to create awareness about productivity, that better ways exist to do the things we do. For the past two decades there has been no funding source geared toward technology transfer productivity centers operating for the private sector. It is a matter of dollars in the right direction. The federal government should also play a role in the area of human resources education, research, and assistance. The areas of technology and management should be the provinces of the university and the private sector.

Academic rewards, profit incentive, valuable shared information, and increased efficiency are the incentives that would create more interaction among productivity organizations. PENNTAP believes that the introduction of new technologies and management techniques will be very important for increasing its clients' productivity in the future.

Ideal Productivity Organization

Given the opportunity to establish a new productivity organization, PENNTAP would likely maintain its current structure and philosophy. One area that would be interesting to explore is helping businesses and individuals learn about the ways the increasingly ubiquitous computer technology can be made to serve their needs. This would take some of the pressure off the program's clients.

The staff should be highly motivated, with good work experience and loyalty to PENNTAP's service philosophy.

Productivity, Research and Extension Program
North Carolina State University
P.O. Box 5511
Raleigh, NC 27607
(919) 733-2370

Major Orientation:
Technical

Size: Medium

Director: Dr. William A. Smith, Jr.

Primary Mission of Organization

The Productivity Research and Extension Program (PREP), a nonprofit program established to promote economic growth and stability through productivity improvements, provides coordination and communication on productivity-related activities among various units of the University System of North Carolina, government agencies, and private organizations.

Nature and Work of Organization

PREP was established in 1975 and has a formal charter. The program also has a steering committee and task forces which are composed of members of the university and industrial communities and which are the principal units for generating proposals and monitoring progress for generic research in PREP's manufacturing operations program.

PREP's expenditures for FY 1983 totaled \$1.68 million. Of this total, 37.7% was generated by corporate giving; 25% by grants and contracts; 20.7% by state funding; 12.6% through membership fees; and 4% through product sales.

Of the program's total expenditures, 76.8% are made in the technical area; 15.8% in management; and 7.4% in human resources. The program devotes 50.3% of its total expenditures to education; 20.7% to research; 20% to assistance; 5.8% to publication; and 3.3% to administrative efforts. Fifty-four percent of the program's budget is spent providing productivity services to the manufacturing sector; 23.4% to government; and 22.6% to the service sector. Last year PREP assisted 14,000 firms by providing educational services; 1,244 with assistance; and 19 with research.

Ninety-four percent of PREP's expenditures were made in North Carolina; 5.2% in the nation, excluding North Carolina; and .8% in the international sector. The program staffs 18.4 equivalent full-time professionals and 12.2 EFT support persons. Fourteen professionals and 11 support staff work full time with the program.

Organizational Techniques and Resources

The sources of the technology PREP transfers to its clients include research by faculty at North Carolina State University; private consultants in the areas of engineering and management; NTIS, NSF, and DOE data bases; the North Carolina State University technical library; and information sharing among industries in which PREP acts

as a catalyst. The data resources PREP uses include NTIS, NSF, and DOE data bases; the North Carolina State University system library network; and the North Carolina Science and Technology Center.

In terms of relationships PREP has established with other productivity centers, it has conducted a project with and is on the advisory committee of the Georgia Productivity Center; attends meetings of the IIT Manufacturing Productivity Center; has worked with the Maryland Center in the area of quality circles; and has exchanged information with the Utah Center and productivity organizations in the southeastern states. The training packages PREP uses include 50 workshops covering all aspects of productivity; 300 audio tapes on technical and management topics; 400 industrial training films; short courses on the North Carolina State University campus; and videotaped courses.

PREP uses industry needs workshops and nominal group techniques to identify significant new technologies or management practices which will impact its clients. University associates, who are faculty members working part-time with the program, are also helpful in this effort. In general the program uses no formal diagnostic procedures to identify areas in need of productivity improvement for clients. For generic studies the program uses industry advisory groups and with specific clients the center will look at specific areas that present problems or opportunities.

In its work with individual firms, PREP takes a problem solving rather than strategic planning approach. With larger companies the program takes a longer-range view, but with smaller companies the approach has been short term. The center concentrates its assistance in areas in which the client seems most interested in implementation. PREP's approach has been to deal with issues the companies themselves raise rather than tell them about problems they are not interested in facing.

Major Strengths of Organization

The major strengths of PREP in accomplishing its primary productivity mission are its level of industry interaction, specifically its Industry Advisory Board for manufacturing operations research; its steering committee which meets four times a year; its access to laboratory facilities; its level of faculty and administration support; and tuition grants.

Organization's Most Successful Project

Guilford Mills, Inc., a textile firm with corporate offices in Greensboro, N.C. and New York City, was interested in improving productivity, product quality, and profits to enhance its competitive position in a market noted for seasonal and fashion-related fluctuations. Management desired to emphasize human resource development on a do-it-yourself basis.

The Guilford Mills project demonstrated that a clinical, do-it-yourself approach to productivity improvement can be successful. The assumption that a corporation can generate its own programs with

minimum third-party coaching appears valid. The efficacy of academic-industrial cooperation in the traditional land-grant institutional format appears to have been reaffirmed.

Capital expenditures were made to invest heavily in the future of the company. Plant sites purchased had the effect of preserving jobs. New equipment installed and a new facility constructed created new jobs. Work force scheduling and planning had the effect of job expansion in creating new positions at higher skill and pay levels.

Organizational Problems and Needs

Among the weaknesses PREP must contend with are a lack of state funding and resources which are necessary because project funding has no continuity; the lack of full-time personnel and dependence on part-time personnel also limits continuity of research and development. PREP has projects rather than ongoing, established programs.

Among other problems facing PREP are a lack of incentives for faculty participation; lack of coordination with other units for use of laboratories; insufficient resources, space, and support staff; lack of support from traditional external funding sources; limited internal recognition; and marketing PREP and other research programs on campus. The moratorium on funding new programs by the federal government has led to very severe budgeting problems in the last couple of years.

The main problems PREP has encountered in promoting its services have been slow administrative support and the difficulty of obtaining publicity for accomplishments.

To achieve its growth plans PREP requires both laboratory and office space and additional professional and support staff and faculty and students to work on projects. PREP believes that its opportunities would be greater if it were part of a network which supplied information, delivery modes (satellite communications), case studies, and generic information, in that order of priority. PREP also believes that its stature would be enhanced through national affiliation because it would be easier to attract funding and would help standards and performance guidelines. However, the program believes that its reputation ultimately depends on the results it delivers.

Organizational Changes Envisioned for the Next Five Years

PREP foresees a doubling of the amount of expenditures it devotes to research, with slight decreases in assistance and publication and a significant decline in education. These changes reflect internal decisions made by PREP and a desire to interact with industry in the research area to a greater extent. The percentages of expenditures PREP devotes to providing productivity services to the manufacturing and service sectors and government will remain roughly the same.

A number of internal changes are planned within PREP to clarify the roles of the productivity center and other mission-oriented programs; develop greater cooperation among academic units; have

productivity initiatives funded at \$4,000-\$7,000 to involve more personnel from mechanical engineering, electrical engineering, industrial engineering, etc.; and to develop a better understanding and closer working relationship with the textiles and furniture industries, among others.

Productivity services PREP's clients request that the program does not offer include office automation from the professional worker's point of view; methods of measuring productivity, particularly of high cost knowledge workers; and locating and evaluating software packages needed for engineering, manufacturing, design, inventory, production, and other operations. There are abstracts of software lists, but you need an industrial engineer with computer skills to interpret them.

PREP believes that its clients would make good use of a management development institute or technical institute to pull together the diverse components comprising productivity. All active centers are engaged in parts of the productivity picture, but not in the entire spectrum. A format responsive to the marketplace is needed. PREP's clients could also use a productivity audit/measurement tool to help identify problem areas.

Future Productivity Issues

PREP believes that future opportunities for productivity organizations lie in the area of factory automation (manufacturing systems, not process operations); office automation; and management information systems. PREP sees no need for standard training course modules on productivity.

PREP does see a need for a national program to fund further research in productivity on such topics as measuring the performance of knowledge workers; product and service quality, including software; logistics and control systems; product design for automated manufacturing; and the impact of office automation.

PREP also sees a need for a national productivity office to perform planning with regard to supporting target industries and not supporting industries that have not been targeted and to perform industry-wide studies without concern for regulatory agencies and antitrust implications. PREP is positively disposed toward national accreditation for productivity organizations because at present there is the problem of unqualified individuals starting and stopping productivity organizations.

PREP believes that the federal government can step up its activities in the productivity area, not by establishing a large organization, but by increasing awareness that productivity can be increased and by serving as a motivator, focal point, and stimulus for productivity improvements. The federal government can also promote alternatives for increased industry-university interaction. PREP sees promoting technology awareness as being a high priority for the federal government, along with providing funding and other types of assistance in the areas of technology transfer, management assistance, and human resources assistance. The federal government should not be

involved in management education, and technology development should be addressed by the private sector with university assistance.

Interested productivity organizations would be more likely to share information if funding were available to gather and prepare case materials.

Rather than emphasize the introduction of new technologies or improved management techniques, PREP believes that most firms could make significant improvements in productivity using off-the-shelf technologies. The largest proportion of industries are not high-tech-related and need assistance in technology transfer and management techniques. However, microelectronics applications will be important.

Ideal Productivity Organization

Given the opportunity to establish a new productivity organization, PREP would set up a center that would have a regional role in North Carolina and adjacent states. It would have a director; an associate director for administration; technical directors for laboratories; 5 EFT project leaders on leave from industry, whom industry would salary; 4 EFT faculty members on a part-time basis (20 @ 20% time); 30 graduate research assistants; and a support staff of 3 clericals and 2 technicians. Industry/academic task forces would monitor projects in different program areas.

The center's programs would be oriented toward the kinds of industry in the region, excluding agriculture. Textiles, furniture, computers, electronics, and machinery are examples of program thrusts. The center would also have thrust programs that would not be based on geography, such as manufacturing operations, that would attain national recognition.

Productivity Evaluation Center
Virginia Polytechnic Institute
& State University
302 Whitmore Hall
Blacksburg, VA 24601
(703) 961-4568

Major Orientation:
Technical

Size: Small

Director: P.H. Gahre

Primary Mission of Organization

The primary mission of the Productivity Evaluation Center is to develop monitors for measuring productivity. This includes labor and materials in the area of production; information systems about labor and inventory in the area of management; and annual reports and total productivity, including economic factors, in the area of corporate productivity.

Nature and Work of Organization

The Productivity Evaluation Center was established in 1980 and has neither a formal charter, an advisory board or a board of directors. For FY 1983, the center's budget was approximately \$200,000, which includes \$50,000 for services rendered. Ninety percent of this budget was generated by grants and contracts and ten percent was generated by product sales.

All of the center's expenditures occurred in providing technical services. Activities in this area broke down in terms of expenditures according to the following percentages: 5% for assistance; 20% for education; 25% for publication; and 50% for research.

Of the center's total expenditures, 75% were spent providing productivity services to academic clients through research and 25% were spent providing productivity services to the manufacturing sector. Assistance to firms included 10 cases of direct assistance; 75 instances of providing educational services (e.g., work sampling, quality control); and 100 instances of providing publications.

Sixty-seven percent of the center's expenditures were made within the State of Virginia and 33% were international.

The center employs one full-time support staff member. The center's staff, in terms of equivalent full-time employees, consists of one EFT professional and 3 EFT support staff.

Organizational Techniques and Resources

The primary sources of the technologies the Productivity Evaluation Center transfers to its clients are its own evaluation techniques and computer software. The data resources used by the center include Department of Commerce publications; Bureau of Labor Statistics publications; industrial handbooks in the area of "textile economics"; and CRISP, University of Chicago corporate financial data.

The center is a member of the Network for Productivity and Quality of Work Life Centers; gains information from AIIE in Atlanta; and tries to promote productivity through the National Chamber of Commerce. The center uses training packages in the areas of financial incentives; participative management; quality control; work simplification; work measurement; and preventive management.

The center does no "improvement" work, has no systematic means of identifying significant new technologies or management practices that will impact its clients, and takes as one of its objectives the attempt to define productivity trends by industry group.

Major Strengths of Organization

The Productivity Evaluation Center regards its greatest strength as its close association with the academic faculty at Virginia Polytechnic and its access to the university's computer facilities.

Organization's Most Successful Project

The center regards the development of a fully operational software program to evaluate productivity in companies as its most successful project. The center has no significant outreach program.

Organizational Problems and Needs

The most significant problems facing the Productivity Evaluation Center are a lack of funding and a lack of adequate and readily accessible information sources. The idea for the center emanated from the Office of the Governor of Virginia, and the center received its initial and only funding of \$200,000 in July 1980. These funds have been completely expended since that time.

The center has not needed to promote its services by a formal program; its only promotional efforts have been through workshops, conferences, and speeches.

To achieve its growth plans, the center would require more student help; more money for fellowships; and better access to data bases that are available.

The center feels its opportunities would be greater if it were part of a network that supplied case studies, information, and generic research, in that order of priority. The center also believes that this stature would also be enhanced though a national affiliation because of the increased recognition it would provide.

Organizational Changes Envisioned for the Next Five Years

The center foresees its expenditures in the area of assistance increasing over the next five years, particularly with regard to microcomputer applications of evaluation procedures in companies. It also sees its work with the manufacturing and service sectors increasing as the center seeks to implement its diagnostic methods. However, the center has no present plans to modify or change the services it currently provides.

In terms of services clients request that the center does not provide, basic industrial engineering, including quality control and work simplification, are primary. The center believes its clients will need in-house systems to measure and monitor productivity over the next five years.

Future Productivity Issues

The Productivity Evaluation Center believes that future opportunities for productivity organizations lie in assisting companies in capital investment decisions, including equipment selection, investment timing, and strategic planning. Another area of opportunity is the in-plant training of current workers.

The center sees no need for standard training course modules on productivity. However, it does see a need for a national program to fund further research in productivity, primarily for financial reasons. The issues this program could explore include basic research on the economic and social factors affecting productivity; productivity trends; and technological research, including automation, optimization, energy, and conservation. National meetings -- not conferences -- and national publications would be required to create more interaction among productivity organizations.

The center is opposed to the idea of national accreditation because different centers have different objectives and defining a common standard would not be feasible. The center does believe there should be a national productivity office that would serve as a clearinghouse for information, research, and funding.

The center believes that the federal government should create capital incentives in the tax structure to modernize industrial equipment, as has been done in Japan. Technology awareness, development, and transfer should be the role of universities and the industrial sector. The center also believes that the introduction of new technologies or improved management techniques is most needed and will be very important in increasing the productivity of its clients.

Ideal Productivity Organization

If the Productivity Evaluation Center were to establish a new productivity center, its focus would still be exclusively technical. It would market its services both nationally and internationally, and provide services to manufacturers, banks, and trading companies. The staff would include a computer specialist, an economist, and an accounting/finance specialist.

National Center for Public Productivity
John Jay College
City University of New York
New York, NY 10019
(212) 489-5030

Major Orientation:
Human Relations/
Management/Technical

Size: Medium

Director: Mr. Mark Holzer

Primary Mission of Organization

The National Center for Public Productivity is a training, service, and research organization devoted to improving productivity in the public sector. The National Center is the only university-based center of its kind, working with the support of administrators, elected officials, and academicians throughout the U.S.

The center's mission is to provide the means by which local, state, and federal agencies can further improve their efficiency and effectiveness. In particular, the center has been successful in bridging the gap between productivity improvement concepts and the managerial application of that knowledge, between theoretical research and administrative practice.

Nature and Work of Organization

The National Center was established in 1975 and has a formal charter and an editorial board for publications. For 1982, the center's expenditures were \$1.7 million. Eighty percent of the center's total budget is generated by grants and contracts, 10% by product sales, and 10% by foundations. Sixty percent of the center's expenditures are made in the area of human relations; 30% in the management area; and 10% in technical. Sixty percent of the center's expenditures are devoted to education; 20% to publication; 10% to assistance; and 10% to research.

All of the center's expenditures are made providing services to local and state governments. Within the last year the center provided assistance to six organizations and performed research for six others. The center also provided educational services for 4,000-5,000 organizations and publications to many thousands of others.

All of the center's expenditures were made in the U.S., with 80% of those in the New York State. The center employs 28 full-time professionals and 6 full-time support staff.

Organizational Techniques and Resources

The primary source of the technology the center transfers to its clients is management activities. The center uses all public sector data bases as well as a major collection the center itself maintains. The center is an active member of the National Network of Productivity Centers and a formal member of both the American Society of Public Administration and the National Association of State Training Directors.

In the area of productivity the center uses the following training packages: Managing for Improved Productivity; Implementing a Productivity Improvement Program; and Productivity Measurements.

In the area of management and supervision the center uses the following training packages: Management Concepts and Skills (Basic and Advanced); Management by Objectives; Budget Preparation and Management; Project Management; Time Management; Stress Management; Communication Skills; Public Speaking Skills; Leadership Skills; and Decision Making.

In the area of Job Skills the center uses the following training packages: Operational Auditing (Basic and Advanced); Financial Findings; Report Writing/Business Writing; Records Management; Speedreading; Executive Secretarial Skills; Investigative Techniques; Interviewing Skills; Case Preparation and Management; Court Hearings and Procedures; Collection Techniques; Legal Training for Court Workers.

In the area of EDP and Systems the center uses the following training packages: Basic Statistics for Managers; Statistical Sampling and Analysis; Systems Analysis; EDP for Managers; EDP for Auditors; Introduction to BASIC Programming; Introduction to COBOL Programming; Advanced COBOL Programming; and Telecommunications.

In the area of program evaluation and review the center uses the following training packages: Program Evaluation Techniques; Program Auditing Techniques; and Integrated Management & Budget Planning.

To identify new technologies or management techniques that might impact its clients, the center uses information that it obtains through a clearinghouse (at least 50 units of information per month) and scores of different cases or studies that the center obtains every month. The center employs needs analyses to identify areas in need of productivity improvement for clients.

The center's diagnostic procedures focus primarily on current conditions in the public sector. Once several areas of potential productivity improvement have been identified, the client establishes priorities, with primary consideration to the area of greatest payback or the skills of the center's staff.

Major Strengths of Organization

The major strength of the National Center is its commitment to providing viable services to the public sector both in New York and across the U.S. Another strength is the center's established track record. The center has been in existence for a good period of time, is well recognized, and has a keen awareness, because of its relationship with key people in the public sector, of the problems that exist.

The center also has good resources to draw on through its data bases that provide access to problem-solving information. The center is currently publishing a resource guide that will list hundreds of bibliographies, citations, case studies, and audiovisuals that will be an important resource in the center's assistance efforts and also for

public sector organizations in solving their own productivity problems.

Most Successful Project

The National Center considers its staff training in human resources for the New York Social Services Program to be its most successful project. It is a \$1 million contract program that will soon be expanded to New Jersey social workers.

Organizational Problems and Needs

The National Center might possibly be more effective if it had an independent base from which to operate. John Jay College of the City University of New York has its own particular environment and mission, and the center is somewhat restricted. Consistent funding is also a major problem that limits the center's visibility to the public sector. Many of the staff operating the center have dual responsibilities of an academic type.

The National Center faces increased competition from alleged productivity experts who blur the field and who don't appreciate what the public sector environment and needs really area. The center is undercapitalized and does not have much money to invest in new programs. The center is picking up many of the functions of the now-defunct National Center for Productivity and Quality of Work Life but has none of the resources that center did.

The major problem the center has faced in promoting its services has been a lack of funding to create an awareness of the center's capabilities and resources. As mentioned earlier, the center also suffers from competition from national accounting and consulting firms that are now pursuing contracts in the productivity area and that are able to make slick presentations. The center believes that it is an excellent model for a public sector productivity center, but it lacks the resources to operate efficiently.

To achieve its growth plans, the center requires multiyear funding at an assured level that will allow the center to plan. The center believes that its opportunities would be greater if it were part of a network which supplied case studies, information, and generic research, in that order of priority. The center's local stature would be enhanced by national affiliation because it would provide some recognition.

Organizational Changes Envisioned for the Next Five Years

Due to a greater need for hands-on assistance for implementation, the center believes that its activities in the area of direct assistance will more than double and its activities in the area of education will decline by about 25%. However, the center does not believe that its client base of state and local governments will shift at all. The center plans to offer more assistance services in the New York area, building to a U.S. market.

Access to particular types of information and major assistance services are among the services that clients request but that the center cannot provide. The center recently had such an enormous number of requests for publications on productivity that it could not fill all the orders.

The center would like to get involved with case studies to a greater degree to show how and why and whether or not certain methods work. The center would also like to do more with technological applications with microcomputers and become more involved with data bases. The center would also like to provide more follow-up on its work with management techniques, a very important area of concern in the public sector.

Future Productivity Issues

Areas of future opportunity for productivity organizations include basic management training, teaching people how to be more productive at what they do, and activities associated with measurement, quality circles, and technology.

The center sees a tremendous need for standard training modules in areas like measurement, technological innovation, operational innovation, labor/management cooperation, and particular management principles related to productivity. These should be supported by case studies and audiovisual materials, trainers' guides, and proper evaluation. Too much superficial training is being done.

The center does see a need for a national program to fund further research in productivity, particularly in such areas as labor/management cooperation; quality circles in government settings; quality circles in terms of technology; robotics in sanitation; microcomputers; gain-sharing and incentives; and negotiating for productivity. Much could be done in terms of how you can institutionalize productivity issues in contracts.

The National Center fears that if a national productivity center were established, the public sector would be made subordinate to the private. Whatever funds would be used to create this center should be used to fund a couple of centers that would take a lead role. Under the present administration, the public sector would get short-changed if a national center were created; this administration is totally interested in the private sector.

The appropriate role of a national productivity office would be to support the 10 most prominent productivity centers that are part of the network now. These centers are the focal point of the network and the national center could provide some support for the meetings these centers have, enable more frequent and more specifically focused meetings, and fund projects and publications that the centers could take part in cooperatively.

With regard to national accreditation for productivity organizations, commitment would be the main issue. Before a center is accredited it should have to show some multi-year projects that were evaluated successfully by the contracting firm or agency. They should show substantial publications; a professional range of skills;

financial stability; recognition by their peers as a valid organization; information capabilities; a library dedicated to productivity; and the ability to respond to requests for assistance.

The federal government should take an increased role in training its own managers; program evaluation and review; dissemination of information; and publications. The federal government needs to be a catalyst. It should provide funding to key organizations. Productivity improvement will not come from the bottom up. Government initiative and cooperation with all sectors of the economy is required.

Nothing will be more important than the introduction of new technologies and improved management techniques in increasing the productivity of the National Center's clients.

Ideal Productivity Organization

Given the opportunity to establish a new productivity organization, the center would operate in a very similar manner to the way it currently does. The proper approach has been developed; what is needed is greater funding and consistent funding. Emphasis should be placed on direct and frequent feedback, with client organizations calling on the center for assistance. For the most part the center believes it has already established a satisfactory model, but the public sector lacks the necessary resources.

APPENDIX C

Data Tables

Appendix Table C-1

Statistics on Productivity Organizations by Size and Major Orientation

<u>Total</u>	Number of Equivalent Full-time			Number of Equivalent Full-Time Employees				
	<u>Professional</u>	<u>Staff</u>	<u>Total</u>	<u>Assistance</u>	<u>Education</u>	<u>Publications</u>	<u>Research</u>	<u>Other</u>
Total	710.5	428.9	1139.4	362.9	291.4	133.1	337.7	14.3
Average	16.1	9.7	25.9	8.2	6.6	3.0	7.7	.3
Median	5	3	10	2.2	1.2	.6	1.8	0
Minimum-Maximum	.5-200	0-100	.5-250	0-87	0-45.5	0-26.2	0-125	0-4.2
<u>Size</u>								
Small								
Total	64.8	41.8	106.5	33.9	17.8	11.6	34.2	9
Average	2.8	1.8	4.6	1.4	0.8	0.5	1.4	0.4
Median	3	1	4	1	.3	.4	.6	0
Minimum-Maximum	0.5-6	0-6	0.5-10	0-5	0-3.7	0-2.5	0-10	0-4
Medium								
Total	208.7	109.2	317.9	91.7	96.1	37.2	87.5	5.3
Average	13.9	7.3	21.2	6.1	6.4	2.5	5.8	.4
Median	13	6	18.5	6.1	5.4	1.8	5.6	0
Minimum-Maximum	5-28	0-20	12-34	0-17	0-20.4	0-8.7	0-16.7	0-4.2
Large								
Total	437	278	715	237.2	177.5	84.2	216	0
Average	72.8	46.3	119.2	39.5	29.6	14	36	0
Median	45	42.5	102.5	35.6	28.1	12.2	20.6	0
Minimum-Maximum	5-200	10-100	50-250	0-87	16.5-45.5	0-26.2	8.5-125	0-0
<u>Orientation</u>								
Human Relations								
Total	108	149	257	64.8	53	40.6	92.1	6.42
Average	7.7	10.6	18.4	4.6	3.8	2.9	6.6	.5
Median	5	2	12.5	1.3	.6	.5	3.5	0
Minimum-Maximum	2-22	2-15	4-24	1-9.6	0-2	0-3	2.2-14.4	0-4.2

Appendix Table C-1 (cont.)

<u>Total</u>	<u>Number of Equivalent Full-time</u>			<u>Number of Equivalent Full-Time Employees</u>				
	<u>Professional</u>	<u>Staff</u>	<u>Total</u>	<u>Assistance</u>	<u>Education</u>	<u>Publications</u>	<u>Research</u>	<u>Other</u>
Human Relations/Management								
Total	85	49.5	134.5	25.9	65.7	11.6	31.3	0
Average	14.2	8.2	22.4	4.3	10.9	1.9	5.2	0
Median	3.5	2.2	5.5	2.2	1.6	.6	1.1	0
Minimum-Maximum	3-40	1-33	4-65	0-16.5	0-45.5	0-8.5	.45-19.5	0-0
Management								
Total	41.8	15	56.8	14.6	21.2	5.4	11.6	4
Average	6	2.1	8.1	2.1	3	.8	1.7	.6
Median	5	2	7	1	2.5	.7	1	0
Minimum-Maximum	1.8-12	0-4	3.8-16	0-5	0-9.6	0-2.5	0-8	0-4
Management/Technical								
Total	183	110.2	293.2	148.5	62.9	32.1	49.8	0
Average	30.5	18.4	48.9	24.8	10.5	5.4	8.3	0
Median	9	11.5	20.5	7	5.2	3.5	6.1	0
Minimum-Maximum	2-110	1-50	3-145	.6-87	0-30	0-14.5	0-21.8	0-0
Technical								
Total	254.7	79.2	333.9	99.7	59.1	27.9	143.4	3.9
Average	31.8	9.9	41.7	12.5	7.4	3.5	17.9	.5
Median	9	4	13.5	3.5	.5	0	1	0
Minimum-Maximum	.5-200	0-50	.5-250	0-62.5	0-37.5	0-25	0-125	0-3
Human Relations/Technical/Management								
Total	38	26	64	9.4	29.6	15.5	9.4	0
Average	12.7	8.7	21.3	3.2	9.9	5.2	3.2	0
Median	9	6	29	3.4	8.7	6.8	3.4	0
Minimum-Maximum	1-28	0-20	1-34	.2-5.8	.5-20.4	0-8.7	.2-5.8	0-0

Source: See Text

Appendix Table C-2

Data on Productivity Organizations

Name	Orientation ^{1/}	Nuner of Equivalent			Percent of Organization's Efforts				
		Professionals	Staff	Total	Assistance	Education	Publications	Research	Other
American Center for QWL	HR	22	2	24	.40	0	0	0.60	0
American Productivity Center	HR/M	40	10	50	.33	.33	.17	.17	0
Bowling Green Prod. & Gainsharing Inst.	HR/M	4	1	5	.70	0	.15	.15	0
Center for Analysis of Prod. - Int. Pers.	HR/M/T	9	20	29	.20	.30	.30	.20	0
Center for Effective Organizations	HR	5	15	20	.15	.10	.15	.60	0
Center for Government & Public Affairs	M	5	2	7	.65	.05	.10	.20	0
Center for Prod Innovation & Technology	HR/M/T	1	0	1	.25	.50	0	.25	0
Center for Productivity Studies	HR	2	2	4	.25	.15	.05	.55	0
Center for Study of Private Enterprise	M/T	7	9.5	16.5	.40	.40	.20	0	0
Div. of Extension & Public Services	HR/M	32	33	65	0	.70	0	.30	0
Florida Center for Productivity	T	3	1	4	.25	0	0	0	.75
Georgia Productivity Center	M/T	110	35	145	.60	.15	.10	.15	0
Institute for Productivity	HR	15	2	17	.50	0	0	.25	.25
International Assoc. of Quality Circles	M	6	4	10	.50	.25	.25	0	0
Management & Behavioral Science Center	M	12	4	16	.25	.25	0	.50	0
Manufacturing Productivity Center	T	200	50	250	.25	.15	.10	.50	0
Maryland Center for Prod. & QWL	HR/M	3	3	6	.25	.25	.25	.25	0
Michigan QWL Council	HR	5	3	8	.50	.30	.05	.05	.10
National Center for Public Prod.	HR/M/T	28	6	34	.10	.60	.20	.10	0
North Carolina State	T	18.2	12.2	30.4	.20	.50	.06	.21	.03
Northeast Labor-Management Center, Inc.	M	2	2	4	0	0	0	0	1
Oklahoma Productivity Center	M	3	1	4	.25	.25	.25	.25	0

Appendix Table C-2 (cont.)

Name	Orientation ^{1/}	Numer of Equivalent			Percent of Organization's Efforts				
		Professionals	Staff	Total	Assistance	Education	Publications	Research	Other
Oregon Productivity Center	M/T	3	1.25	4.25	.45	.20	.15	.20	0
Organization Behavior Program	HR	4	0	4	.30	0	0	.70	0
PENNTAP	T	14	3	17	1	0	0	0	0
Pennsylvania MILRITE Council	M/T	2	1	3	.20	0	0	.80	0
Productivity Center - GSU	HR	18.5	0	18.5	.03	.03	.04	.90	.0
Productivity Center - U.S. Chamber	M	1.75	2	3.75	0	.99	0	.01	0
Productivity Center - U. of Arkansas	T	.50	0	.50	.55	.30	.10	.05	0
Productivity Center of the Southwest	M	12	0	12	0	.80	.10	.10	0
Productivity Evaluation Center	T	1	3	4	.05	.20	.25	.50	0
Productivity Improvement Group	HR	.50	1	1.5	.90	0	0	.10	0
Productivity Institute	HR	2	0	2	.60	.10	.30	0	0
Purdue University-CIDMAC	T	5	5	10	0	0	0	1	0
Quality of Working Life Program	HR	2	6	8	0	0	.05	.80	.15
RPI Center for Mfg. & Tech. Transfer	T	13	5	18	.70	.30	0	0	0
State Government Prod. Research Center	HR/M	3	1	4	.65	.10	.10	.15	0
Texas Center for Prod. & QWL	M/T	11	13.5	24.5	.30	.15	.15	.40	0
Texas Hospital Assoc. Statewide Prod. Ctr.	M/T	50	50	100	.45	.30	.10	.15	0
Third Party Studies Program	HR	3	1	4	.25	.25	.25	.25	0
University of Massachusetts	HR	15	9	24	.30	.60	.10	0	0
Utah Center for Prod. & QWL	HR/M	3	1.5	4.5	.40	.40	.10	.10	0
Work in America Institute	HR	9	8	17	0	.33	.33	.33	.01
Work in Northeast Ohio Council	HR	5	100	105	.25	.25	.25	.25	0

^{1/} HR = Human Relations; HR/M = Human Relations/Management; M = Management; M/T = Management/Technical; T = Technical;

HR/M/T = Human Relations/Management/Technical

Source: see text.

Appendix Table C-3

Productivity Service Ratio by State

State	Number of Establishments	Number of Productivity Person Hours Available	Productivity Service Ratio (hours per establishment)
Alabama	30,344	14,000	.460
Alaska	3,775	0	0
Arizona	24,711	4,000	.162
Arkansas	17,840	1,000	.056
California	233,223	67,000	.287
Colorado	30,920	0	0
Connecticut	30,004	0	0
Delaware	5,654	0	0
DC	8,195	63,500	7.749
Florida	95,407	8,000	.084
Georgia	48,760	327,000	6.706
Hawaii	10,152	0	0
Idaho	8,912	0	0
Illinois	101,430	500,000	4.93
Indiana	47,625	20,000	.420
Iowa	29,650	0	0
Kansas	24,356	0	0
Kentucky	28,045	8,000	.285
Louisiana	36,711	0	0
Maine	9,337	0	0
Maryland	36,875	70,000	1.898
Massachusetts	54,935	56,000	1.019
Michigan	76,300	24,000	.315
Minnesota	41,283	0	0
Mississippi	18,639	0	0
Missouri	44,946	0	0
Montanna	8,460	0	0
Nevada	16,544	0	0
Nevada	8,437	0	0
New Hampshire	8,785	0	0
New Jersey	66,308	0	0
New Mexico	12,013	0	0
New York	151,349	268,000	1.771
North Carolina	50,903	60,800	1.194
North Dakota	7,063	0	0
Ohio	95,907	264,000	2.753
Oklahoma	27,679	8,000	.289
Oregon	27,775	8,500	.306
Pennsylvania	99,191	72,000	.726
Rhode Island	9,248	0	0
South Carolina	24,053	0	0
South Dakota	6,956	0	0
Tennessee	38,058	2,000	.053
Texas	137,140	382,000	2.785
Utah	12,968	9,000	.694
Vermont	5,150	0	0
Virginia	45,216	8,000	.177
Washington	39,567	0	0
West Virginia	13,959	0	0
Wisconsin	44,775	0	0
Wyoming	5,694	0	0

Source: See text

APPENDIX D

The National Productivity Network

Issue

A crucially important factor impeding productivity improvement in both the public and private sectors is the lack of a systematic means for delivering existing technological and management innovations to organizations that can realize the greatest productivity gains through their implementation.

Objective

This paper describes a means for delivering productivity-improving innovations through networked regional productivity centers. The objective of the network is to strengthen and extend the innovative process through effective communications and cooperative interaction among member centers.

Nature of Network

The National Productivity Network (NPN) is a consortium of not-for-profit productivity organizations, commonly called centers, that seeks to bridge the gap between academic and scientific research efforts and the businesses and local governments that can implement this research to improve operational efficiency. These organizations are concerned with application of technology, managerial efficiencies, and human resources development.

Some of the centers within NPN have been providing productivity-related assistance for decades. Others were begun more recently as a result of the concern over American productivity that arose in the mid seventies, when the achievements of European and Japanese productivity centers became apparent. NPN seeks to generate improvements in the American economy similar to those the European and Japanese centers have realized in their own countries.

The service areas of NPN member centers constitutes virtually the

entire continental United States. To accomplish its goals, NPN encourages increased cooperation among groups from higher education, business, labor, and government in the belief that a new alliance must be forged among these sectors of our economy if long-term solutions to America's productivity crisis are to take shape.

NPN organizations work with as broad spectrum of clients from small and large industry and local government in both rural environments and major metropolitan areas. NPN is ideally structured to perform this function because its member centers have strong track records demonstrating their quality in a variety of diverse, complementary areas. For example, studies have revealed benefit to cost ratios of 16.7:1 and 22:1 for programs at Penn State and Georgia Tech.

Any center with expertise in a particular area can transfer a technique within that area to all the other centers. In turn, this center enjoys the same benefits when other centers identify techniques in their own areas of specialization. NPN has assisted clients by implementing interfirm comparisons of productivity performance; arranging productivity conferences for the public and private sectors; designing of productivity training programs; performance of productivity audits; and development of diagnostic techniques and objectives matrices; publishing and distributing books and other information about methods of productivity improvements; conducting productivity fairs for state and local government; the completion of policy studies on such issues as new work schedules and older workers; setting up quality circle programs and other techniques for encouraging employee involvement in productivity issues; and helping implement technical improvements in applied technology (e.g., robotics, materials handling, factory automation, electronics controls, office procedures, and management systems).

National Need

NPN's experience has indicated that a crucially important factor impeding productivity improvement, in both the public and private

sectors, is the lack of resources to deliver existing technological and management innovations to organizations with the greatest potential for productivity gains.

Popular belief to the contrary, the greatest potential for productivity improvement does not lie in measures like new tax legislation or the development of entirely new technologies. The most significant gains can be realized by placing existing innovative technologies and management practices in the hands of small and medium-sized organizations that do not have the professional staffs to identify and implement these methods themselves. The organization within NPN work on a direct, one-to-one basis to help business and government clients identify and implement management and technical systems that can increase output and/or streamline use of resources.

Importance

Small businesses are a critically important aspect of the American economy, and any comprehensive productivity effort must address their needs. A 1979 report completed by the Massachusetts Institute of Technology indicated that businesses employing 500 or fewer personnel accounted for 86.7% of new jobs generated in the years 1969-1976. Within the public sector, state and local governments are an important focus for productivity efforts due to the budget constraints under which they must operate. They also have ready access to local business communities and can work with them directly to effect technology transfer and improve management techniques.

While large corporations often have their own productivity centers and can afford expensive consultants, small and medium-sized organizations must rely on groups like NPN to help them identify and implement new technology and innovative managerial methods. NPN works extensively on the local level to aid these organizations in using the resources available to them more effectively. Because of its regional emphasis, NPN's greatest contributions occur on the state, local government, and individual firm level.

NPN assumes that its centers must act as agents of change to bring about the long-term improvements necessary to revitalize the American economy. Creating a suitable economic environment for such improvements is necessary, but will not prove sufficient for effecting lasting gains. The intermediary functions that NPN performs between the management and technological research community and the business community; between users of advanced technology and potential users who could also benefit; and between major institutions involved in the productivity effort are essential to successful and authentic progress in industrial efficiency.

Conclusion

Apart from NPN there are no impartial and authoritative sources readily available to smaller business to evaluate technological and managerial innovations and to help implement them. Given the ferment and dynamic activity characterizing international market competition today, NPN can make an important contribution by assessing the various techniques that are developed and by helping determining how they can most profitably be implemented.

By this means, validation of select productivity improvements takes place, distinguishing highly effective methods from the current multitude of techniques, being advanced, but not assessed, evaluated and disseminated in an efficient, systematic way.

The member centers of NPN strongly believe that a nationwide network of regional organizations should be a basic component of the national productivity infrastructure.

APPENDIX E

Office of Productivity, Technology and Innovation

OFFICE OF PRODUCTIVITY, TECHNOLOGY AND INNOVATION

The Office of Productivity, Technology and Innovation (OPTI) was formed in September, 1981 by the Reagan Administration. Its mission is to improve private sector productivity through the identification and elimination of barriers to productivity growth, through accelerating the transfer of Federally developed and funded technology and through operating an information and outreach program to the business community.

Additional details on OPTI activities include the following:

Policy Development and Coordination

- . Identifying and analyzing factors (economic, regulatory, legislative, fiscal, institutional, etc.) impeding private firms' ability to enhance productivity growth rates and seeking methods to eliminate them;
- . Developing new Federal policies to create an economic climate conducive to productivity growth at the industry-firm level;
- . Promoting increased private sector use and understanding of productivity measurement techniques;
- . Coordinating DOC productivity-related activities, currently involving the expenditure of an estimated \$67 million annually;

Technology and Innovation

- . Increasing U.S. productivity/competitiveness by identifying barriers to growth in U.S. technology and innovation (e.g., patent policy, government procurement, allocation of R&D);
- . Implementing, within resource constraints, the Stevenson-Wydler Technology Innovation Act of 1980, including transfer of Federally-funded technology to U.S. business and state and local governments, assisting cooperative R&D arrangements, and performing studies;
- . Establishing mechanisms to gain private sector and Federal, state and local government advice on technology and innovation issues as they affect U.S. productivity and competitiveness;
- . Reviewing legislative and other proposals affecting technology and innovation advancement;
- . Analyzing selected foreign technology and innovation policy developments for U.S. economic and trade position implications;

Information and Outreach

- . Providing basic, best-practice productivity information to business decision-makers;
- . Disseminating case studies of productivity improvement programs for private sector use;
- . Encouraging private sector productivity improvement through seminars and workshops;

For further information contact:

U.S. Department of Commerce
Office of Productivity,
Technology and Innovation
Room 4822
Washington, D.C. 20230
Phone: (202) 377-1581
Egils Milbergs, Director

APPENDIX F

Newsletter



NATIONAL PRODUCTIVITY NETWORK

NPN HOLDS FIRST ORGANIZATIONAL MEETING

The National Productivity Network, a consortium of productivity centers, met at the Georgia Productivity Center, Georgia Institute of Technology, on October 27 and 28, 1983, to adopt an organizational structure and handle related matters.

Fifteen centers were represented at the meeting, which was first announced at the White House Conference on Productivity held September 21-23. Mr. Rudy Yobs, the 1982-83 Chairman, organized and chaired the session. Other members of the steering committee include -- Dr. Scott Sink, Director, Oklahoma Productivity Center; Dr. Leroy Marlow, Director, Pennsylvania Technical Assistance Program; Dr. Gary Hansen, Director, Utah Center for Productivity and Quality of Working Life; and Dr. Thomas C. Tuttle, Director, Maryland Center for Productivity and Quality of Working Life.

Network objectives include promoting cooperation and sharing of programs between states and regions, and advocating productivity and quality of working life improvement at both the state and national levels. Early priority is being given to the development of an electronic mail system to link all centers in the Network. Various options are currently being explored to accomplish this.

News from the Centers

American Productivity Center
Houston, Texas

Kathleen Sutton
(713) 681-4020

- The American Productivity Center held its annual Founders' Day meeting in early November. The meeting included a review of the Center's participation in the White House Conference on Productivity, its White Collar Research Project, the Baking Industry Interfirm Comparison and other major projects.
- The Center kicked off two computer-networks in November. Individuals in the productivity management network are examining an entire range of management issues from building awareness and commitment to the organization development process. The other computer network is examining the issue of quality. The Center is planning to offer several new computer networks in early 1984.

- In late December, the Center is releasing its 1983 statistical compilation of national and international productivity statistics as well as its annual annotated productivity literature review.

Georgia Productivity Center
Atlanta, Georgia

Robert S. Hawkins
(404) 894-3830

- In an example of inter-center cooperation, the Oregon Productivity Center Workshop was recently presented to twenty-five staff members of the Georgia Productivity Center. Glenn Felix, Associate Director of O/P/C, conducted the two-day program, which focused on: the PROD-5 Productivity Diagnostic, an audit/survey that can be used to assess the climate and potential for productivity gains in organizations; productivity by objectives; inter-firm comparison; and, the Objectives Matrix, a productivity measurement system now experiencing widespread reception in many Pacific Northwest Organizations.
- GPC recently interacted with the Maryland Center for Productivity and Quality of Working Life by involving six Georgia firms in an evaluation survey of companies having Quality Circles. The project, under the direction of Tom Tuttle, Maryland center, includes many areas of the U.S., plus Japan and Australia.

Productivity Council of the Southwest
Los Angeles, California

John Hermann
(213) 224-2975

- The New Horizons on White Collar Productivity Conference was held April 27-28, 1983, on the Historic Queen Mary in Long Beach, California. The second annual conference consisted of four tracks: Worker Involvement/QWL, Managing Productivity, Public/Service Sectors, and Office Automation. Exhibit booths were available. Over 30 productivity leaders from labor, management, government, and academia made presentations. This year's event was held in conjunction with the meeting of the Network of Regional Productivity and Quality of Work Life Centers. Several centers made presentations at the conference. A handsomely bound set of proceedings, consisting of 300 pages of material, was printed. Included are the presentations of Roger Porter, Assistant to the President of U.S., Dr. Bruce Merrifield, Assistant Secretary of Commerce, and Dr. Lloyd Lehn, Office of Secretary of Defense. Approximately 100 copies are available for purchase at \$25 per copy.
- Other items for sale: Souvenir coffee mugs and QC video tapes

A few coffee mugs are left over from the White Collar Productivity Conference held on the Queen Mary. Two styles are available. One style has the PCS logo and name. The other has the PCS logo, name, and conference name. The cost is \$10 per coffee mug. These handsome mugs will be nice to use in your office and will help to publicize the Center.

Wayne Rieker, President of Quality Control Circles, Inc., was the luncheon speaker at the Quality Circles Practitioners Conference held March 23, 1983. Wayne, while at Lockheed Missiles and Space, implemented the Quality Circle concept at Lockheed and to the U.S. following a trip to Japan. His luncheon

speech was videotaped and six copies, in VHS format, are available for \$75 a copy.

The above items may be ordered from Mr. John Hermann, 1221-B Umatilla, Long Beach, CA 90804. Make checks payable to Productivity Center of Southwest.

The Productivity Center at Georgia State University Evelyn M. Young
Atlanta, Georgia (404) 658-4250

- As background, the Center was designed as a university-wide unit and was approved in December, 1981. It became operational in September 1982, when faculty appointments to the Center became official. Stanley J. Smits, Director of Research in the College of Business Administration, served as its Interim Director until November 1, 1983, when Michael J. Jedel was appointed Director. Dr. Jedel is a Professor in the Department of Management. The 37 Center faculty members, and doctoral students with similar interests from their departments, provide a research capacity focused on human, cultural and organizational factors contributing to productivity. A common interest throughout the faculty deals with measurement.
- The first Center project, completed by Dr. Thomas B. Clark and his colleagues, entitled, "Designing Your Own Productivity Improvement Program" describes the process used by organizations to analyze the options/constraints unique to their situation at a given point in time. A current major project with funding from the National Science Foundation, the Alfred Sloan Foundation and the Exxon Education Foundation, under the direction of Dr. Paula E. Stephan, Professor of Economics, deals with "Age, Vintage and Time Effects on the Productivity of U.S. Scientists." The study is expected to be completed by Fall, 1985.

Work in America Institute, Inc.
Scarsdale, New York

Ellen Daniels
(914) 472-9600

- Dearborn, Michigan, November 10--In Michigan, where layoffs have cut deep into the work force, unemployment still stands at a paralyzing 14.7 percent and employment security has become a critical issue. The location of a conference sponsored by Work in America Institute on employment security in Dearborn, the heart of the automobile industry, underscored the importance of this topic to this place--and to all of the industrial cities of America.

The all-day conference, one of a series of meetings on employment security is part of the Institute's current national policy study--"Employment Security in a Free Economy," a search for practical alternatives to layoff. The study has been made possible by grants to the Institute by the Andrew W. Mellon Foundation, the Charles Stewart Mott Foundation, and the German Marshall Fund of the United States and draws on the experience and talents of a national committee of 26 distinguished Americans.

- Work in America Institute announces the publication in January 1984 of Short-Time Compensation: A Formula for Work Sharing, edited by Ramelle MaCoy and Martin Morand.

Sponsored by the Institute under a grant from The German Marshall Fund of the United States, this book is a timely analysis of short-time compensation (STC), a new strategy for avoiding layoffs. The combination of work sharing with partial unemployment insurance benefits for lost work time permits employers to retain their entire work force at reduced work time instead of laying off a portion. As a means of reducing unemployment, it constitutes a social invention with important economic, social, and political benefits.

The editors, who have long experience in both labor relations and in short-time compensation, have brought together in this book the research and practical experience of experts in the field, in this country and abroad. The chapter authors review the applications of short-time compensation and its implications for management, unions, and society as a whole; they discuss existing programs of STC in Europe, Canada, and the pioneering states of California, Arizona, and Oregon; and they trace the development of new STC federal legislation.

The book, the most recent addition to the Pergamon Press/Work in America Institute Series, will be available from the publisher, Pergamon Press, Inc. (Elmsford, New York) in January 1984.

Center for Applied Engineering
Rolla, Missouri

John M. Amos
(314) 341-4559

- The Center has recently developed an "Efficiency Audit" for small manufacturing companies. This audit is designed to determine those areas of operation which are unproductive. The audit provides management with potential areas for improvement, such as manufacturing, purchasing, marketing, management, and finance. By a thorough examination of these areas, the audit pinpoints the specific areas of potential problems to which management should give special attention.