COST JUSTIFYING OFFICE SYSTEMS

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CHALLENGES:

It has often been said that Office Automation is

* Impossible to cost-justify
* Can not provide measurable results
* Must be accepted by senior management in a "leap of faith" if it feels good.

While many managers believe that it makes business-sense, they can not effectively convince top management that the company will achieve an appropriate return on its office automation investment.

In many organizations, investments in office automation are evaluated against other alternative profit producing opportunities. Since many organizations have limited financial resources, the challenge is to determine where they can get the greatest return on their investment. This makes business sense. Companies are in business to make money and sound business decisions are based upon a careful analysis of "expected gains" from alternative "application of funds".

Supervisors in factories can count the products "rolling off" the assembly line and determine the benefits of computer automation efforts. However, in offices, efficiencies are not as easily tallied.

Top management is evaluated by profits and earnings. According to an April 28th 1986 Fortune article, CEOs cited their most important objectives as "Improved profits, earnings" and "growth". The issue of "cost containment" was sited by 78% of the CEOs and "productivity" by 77%. Almost 40% of the CEOs responding indicated that progress was slow or little has been made. Office Automation can provide a real value to organizations in helping them realize these objectives.

I am convinced that Office Automation can be cost justified and is sound business investment for many organizations.

In this paper techniques will be presented to help managers cost justify office automation.

EXAMPLES OF APPLYING TECHNOLOGY:

The following are 3 examples of applying technology to solve problems:

COMPUTATION OF PI: Yasumasa Kaneda, a Tokyo assistant professor, calculated pi to 201,326,000 digits. Since most practical applications require a calculation of 10 digits and extremely exact applications only need as many as 30 places, the questions that must be asked are: Why? What value does this have?

ELECTRONIC MAIL TAUGHT CLASS: Professor Gerald Phillips of Penn State University communicates with his Speech Communications class only through the schools Electronic-mail. The class gets weekly lectures from graduate students and other graduate students sit in on group discussions as consultants. Phillips doesn't come to class. Last semester he answered 3,169 questions from his approximately 200 students. This, in theory, could give the students access to the best minds in the country for classes.

AUTOMATIC RADAR DEVICE: The city of Paradise Valley in Arizona has contracted with a firm to help them catch speeders. The firm has technology that checks the speed of vehicles moving faster than a designated speed and takes a picture of speeding vehicles. Owners are identified by their license and the firm mails citations to the owners. The device is capable of issuing 260 citations per hour compared to the police's 2 to 4 per hour. Up to 100 speeders a day are caught. The manufacturer loans the city the device, but for every ticket that the firm writes, it keeps $20. This is a WIN-WIN situation. The city's bottom-line revenue picture is definitely improved and even with the equipment costing $42,500, the firm would break-even within 22 days.

The goal of office automation is to implement technology where there is a quantifiable benefit - a WIN-WIN situation. In many cases the return is more important than the amount invested.

STAGNATION:

There has been some "stagnation" in the improvement of white-collar productivity. In order to achieve increased results management should:

Measure the "return on management".
A plant manager may be rewarded for getting more work from

fewer workers. However, a business professional (manager) is many times rewarded based upon the size of his organization. As CEOs seek to determine the payoff from the staffs they have built, there will be more incentive to justify these staffs. Rewards could be more closely tied to performance than the size of the staff required to do the work. This will increase the focus on office automation.

Increase the scope of automation to business professionals. Historically there has been much effort to automate the secretarial staff and cost justify the investment through labor savings that are planned to lead to staff reductions. However, this method of analysis rarely produces the expected results.

Encourage training and the effective use of new technology. Without changing the way employees perform tasks, all the technology in the world will not increase productivity.

HISTORY:

In the 1970's hardware was so expensive that systems were viewed as "cheep" if there was excess capacity on an expensive mainframe-processor. It made economic sense to keep the expensive-processor busy. An investment in software and people could be easily cost-justified. Organizations are now faced with the trade-offs of "One person for one year or a one MIP (millions of instructions per second) processor". With the hardware component of office dropping and the increase use of personal computers, office software systems can be more easily justified.

Many data processing projects were justified by quantifying the tangible and intangible benefits that would be accrued to the project. Many of these efforts historically focused upon the displacement of people. These forecasted displacements did not always materialized. Many company's personal policies and unions do not look favorably upon this type of activity.

There has been much discussion of a "paperless office". It was expected to produce major cost-savings in reducing the amount of paper that was used. While some automation products have the capability to print four pages or more on a single page, the goal of a "paperless office" has not materialized. Through the application of software some paper is saved. However many "office workers" feel the need for "hard-copies" and do not use "electronic-filing technologies". When "office workers" change the way they work, paper in the office will be further reduced.

POTENTIAL MARKET:

According to the U.S. Department of Labor "office workers" comprise 39.8% of the U.S. workforce, or 40.7 million employees. Salaries of the managers, professionals, secretaries, and administrators amount to over $900 billion annually. The 800,000 users of integrated office systems comprise only 2% of the total possible number of end-users.

Market potential is impacted by management's understanding of how benefits are derived.

The following examples demonstrate how the office automation potential expands with effective implementations:

1. Networking and information sharing can increase the benefits. A stand-alone PC has far less potential value than one linked into a network that allows for information sharing and electronic-mail.

2. Integrated systems maximize office automation use. Easy-to-use systems stimulate acceptance.

3. Office automation is not a substitute for effective planning. An excellent system can be designed around an ineffective process. The process can be made to work easier, but it is still not effective.

TOP MANAGEMENT NEEDS:

In demonstrating value of a project to top management, many times cost justifications are required. There are only two ways to impact the bottom-line: increase sales or reduce costs.

There is some information that is very important to have prior to developing a cost justification:

1. Hurdle Rate. How much needs to be justified before acceptance?

2. Project Selection Method. How does top management evaluate projects? (IRR, NPV, Payback., etc.) It is important to know the factors that they will be using to select a project in which to invest.

METHODS:

There have been some very elaborate processes developed to cost justifying office automation investments. Some of these focus around the following:

* Mean time saved by technology times the salary of those saving time.
* Time saved times pre-tax income resulting in opportunity savings.
* Computing savings but not determining the bottom-line effects on the organization.
* Focus on the professionals in the organization and determine their value to the company (the value of management + value of business systems divided by the cost of management + cost of the business systems). It is assumed that organizations can get greater benefit from automation of those who have a greater impact on organizational profits.

The processes that will be explained in more detail in this paper are:

1. HEDONISTIC WAGE MODEL. Determine the amount of "lower level" work being performed by "higher level" workers and derive the impact on reducing the improper allocation by automation.

2. ACCOUNTING ORIENTED MODEL. Evaluate potential contribution to profits of automation focusing on those that are measurable and quantifiable.

3. PROCESS-ORIENTED MODEL. Evaluate processes and determining the potential cost savings and revenue increases that are expected to accrue from automation.

HEDONISTIC WAGE MODEL:

The "Hedonistic Wage Model" was referenced in a study by Sassone and Schwartz in a February 1986 issue of "Datamation".

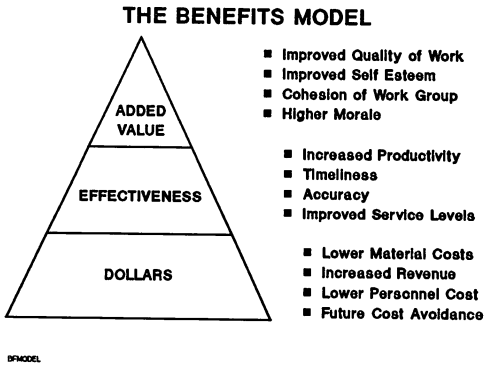
This model assumes that workers are worth what they cost the company in wages, salaries, benefits, and overhead. Their worth can be thought of as the weighted values of the activities that they perform. For example, assume that secretaries spend 85% doing work and are unproductive 15% of the time. In this case the cost of clerical work would be their salary divided by .85. If business professionals spend 50% of their time doing professional work, 35% doing clerical work, and 15% unproductive, then the value of their work would

be a function of the portion of time doing professional work as well as clerical and unproductive work which is computed at a lower value.

The goal of office automation is to increase the amount of time that can be spent on higher-level tasks.

ACCOUNTING ORIENTED MODEL:

This "accounting oriented" model breaks benefits down into 3 categories:



1. HARD DOLLAR BENEFITS - Measurable and quantifiable - direct cause and effect:

These are obtained where there is a 100% direct cause and effect relationship between an expenditure in technology and a resulting impact on the bottom line.

Examples of this type of benefit are: lowering material costs; increasing revenue; lowering personnel costs; future cost avoidance; reducing material costs; reducing the use of outside services (courier services, service bureaus, temporary help); eliminating existing, filled positions; selling unneeded assets (displaced workstations, copiers, file cabinets); measuring a direct improvement in cash flow because of Automated Office Systems (more timely billings and collections); space savings if more space is needed; and avoiding costs if planned (budgeted positions disappear).

2. IMPROVED EFFECTIVENESS - Measurable and quantifiable but not auditable (productivity - getting sales proposals to the customer faster):

This type of benefit is obtained, where there are potentially multiple contributors to an overall change, not just an investment in office automation.

Examples of this type of benefit are increased productivity, timeliness, accuracy or improved service levels; improving the service rates, if this impacts revenue; and quantifying increases in revenues through automation efforts.

3. ADDED VALUE - Perceivable and measurable but not auditable (improvements in self esteem, cohesion, etc.):

This type of benefit is usually associated with the user of the technology, or the people impacted by the technology. An example of this is customer's or supplier's perception of the changes brought about by the technology.

The benefits which can be obtained in this category include improved quality of work, improved self esteem, increased cohesion of work group or higher morale; improving the quality of the employees worklife; better and more timely information for decisions; improved employee morale; reduced error rates; and savings un-budgeted dollars.

These benefits are usually more intangible.

There is a tendency to ignore "intangible benefits" because it is said that they can not be quantified. Ignoring them assigns a value of zero (0) to them in determining ROI, NPV,and Payback. Intangibles can be quantified by using the technique outlined below:

Break down an intangible benefit in its component parts. For example, office automation could "Improve the quality of the employees worklife" through the reduction of redundant / boring tasks. This could result in lower turnover, lower absenteeism, faster promotions, faster learning of new jobs, and higher productivity. Lower turnover reduces recruiting, replacement, and training costs as well as reduces the extra supervision that is often required during the learning period. These costs are easier to quantify (create time and dollar estimates) than the intangible benefit. Personnel departments have a record of some of these costs. Recruiting costs can be a major expense. A study by a California recruiting firm noted that exempt hiring costs (including advertising, travel,

agency fees, relocation costs, interviewing, etc.) run between $3,000 to $27,000 per person with an average of $15,000 while non-exempt employee recruiting costs range from between $600 to $6,000 with an average of $3,300 per person. These do vary by industry and by job classification and the data is available from personnel departments and recruiting firms.

PROCESS-ORIENTED MODEL:

In order to understand the potential impact of office automation on an organization, it is important that a company clearly understand the inner workings of their organization down to the workgroup and individual level. By understanding the current organization, a baseline is established and the type of work being done is understood. In addition, areas of potential improvement become obvious.

The following steps can be helpful in developing process-oriented cost justifications:

1. Determine the area of focus / business problem or need to be addressed. Is there a deviation from industry / activity norms.
2. Understand the current process. Diagram the process for understanding and analysis.
3. Determine how automation can address the business problem or need. What is quantifiable? What is positive impact that office automation makes?
4. Develop the cost justification focusing on "cost-displacement" and "value-added".

In determining how automation can address the business problem or need, the following should be considered:

ADDRESSING THE NEED / IMPROVING THE PROCESS - How does office automation technology make a positive impact on the organization?

* Do the tasks take less time?
* Are tasks completed in a more timely fashion?
* Are tasks not previously being being done now?
* Are tasks done with greater quality / success?
* Is there greater job satisfaction?

DETERMINE THE BENEFIT - Why is change good for the organization?

* Tasks take less time: Where does the time go?
* Tasks are completed in a more timely fashion: What is the rush?
* Tasks not previously being done: Why are they worth doing?

* Tasks done with greater quality / success: Who appreciates quality?
* There is greater job satisfaction: Why pay for satisfaction?

QUANTIFY THE BENEFITS - What is the value of the "good"?

* Increased revenues can occur when the tools are used to generate sales.
* Can increase the odds of closing some sales (quantifiable gain).
* Can reduce the risk of a quantifiable loss.
* Reduce operating and production costs.
* Accelerate revenues.

PROCESS COST JUSTIFICATIONS:

While each organization in unique in how they address problems, there are some "common processes" that can are applicable to other organizations. This section contains a few worksheets that can be used to demonstrate the value of office automation to management.

PROCESS:

In order to perform some tasks there are steps that must be followed.

1. Use the "Need Determination Questions" to help establish top management awareness of the need and user support to helping justify the solution.
   a. HIGH LEVEL QUESTIONS:
      Used when working with managers who are measured by profits, evaluated by profits, and accountable for profits. It is important to verify that the need is understood and supported by high level management before spending an excessive amount of time at the user level.
   b. USER LEVEL QUESTIONS:
      Used when working with those who are involved in doing the work. In order to tailor assumptions to your organization, it is important that the data be verified with those whose needs the solution is addressing.

2. Assume that management and the user understands the process. Use graphics to help explain the process.

3. Use the baseline metrics (in parentheses) as a starting point for the justification. By refining the baseline

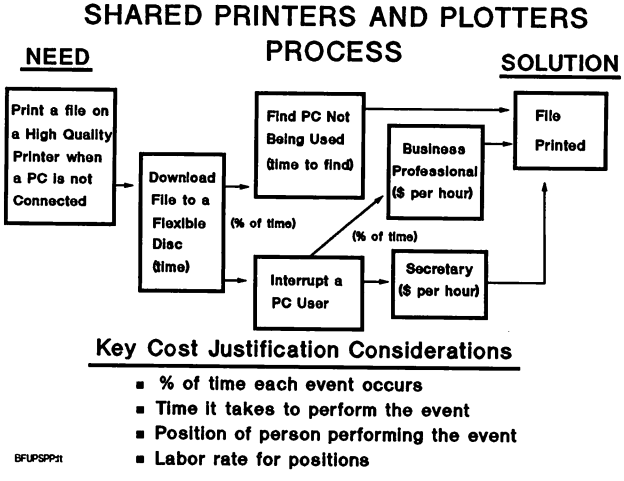
metrics to reflect your organization's situation, individual cost savings and revenue increases can be computed.

4. Verify numbers with knowledgeable people within your organization. Be sure to verify that the assumptions you are using are correct.

5. Compile this data into a cost-justification model.

SHARED PRINTERS AND PLOTTERS

An example of this is a common business scenario of printing a file on a high quality printer when the user does not have one attached to his/her personal computer. There are a finite number of options as can be seen from the following diagram.



Shared printers and plotters allow users to access high quality printers from their PCs. This feature saves the costs of the alternatives (forgo high quality documents which might translate into reduced sales or force users to search out the designated printers located in the building). This section focuses on the time lost looking for a common printer and interrupting another person working there.

NOTE: The potential sales gains from printing on high quality printers is at the end of this section.

I. NEED DETERMINATION QUESTIONS:

A. High level:

1. Do professional looking documents have an affect on revenues?
2. How much time do you believe is "wasted" by business professional trying to get documents printed?
3. Are you missing any important due dates on the delivery of proposals or other material that impacts potential revenues?
4. How important is quality printing to your organization?

B. User Level:

1. How do you currently get your documents printed?
2. Do you find that you "waste time" trying to get documents printed?
3. How much more productive would you be if you had direct access to high quality printers?
4. Would you print additional documents on high quality printers if it were easier to use?

II. WORKSHEET:

A. Savings from Shared Printing

Situation #1: Professional User who searches for printers:

Average time to copy a file (document / spreadsheet / graph) to be printed to a diskette: (1 minute) . . . . _____

Average time to reload file to be printed: (1 minute) . . . . . +_____

Average time wasted per file looking for a PC connected to a printer: (3 minutes) . . . . . +_____

Average time spent walking to a PC connected to a printer: (2 minutes) . . . . . +_____

Number of files that are printed on high quality printers per month per PC not connected to a high quality printer: (40) . . . . . X_____

% of time user of a terminal / PC is not interrupted (75%) . . . . . X_____

Labor rate for Business Professional ($65 per hour / 60) . . . . . X_____

TOTAL for Situation #1 ($227) . . . . . =_____

Situation #2: Professional User who interrupts someone connected to a printer:

Average time to copy a file (document / spreadsheet / graph) to be printed to a diskette: (1 minute) _____

Average time to reload file to be printed: (1 minute) . . . . . +_____

Average time spent walking to a PC connected to a printer: (2 minutes) . . . . . +_____

Number of files that are printed on high quality printers per month per PC not connected to a high quality printer: (40) . . . . . X_____

Labor rate for Business Professional ($65 per hour / 60) . . . . . X_____

TOTAL for Situation #2 ($173) . . . . . =_____

B. Savings by the person being interrupted:

Situation #1: Interrupt Business Professional:

Number of files that are printed on high quality printers per month per PC not connected to a high quality printer: (40) . . . . . _____

% of time user of a terminal / PC is interrupted (25%) . . . . . X_____

% of time user is a business professional (30%) . . X_____

Average time spent stopping tasks, waiting for file to be printed and restarting tasks by person interrupted: (3 min.) . . . . . X_____

Labor rate for Business Professional ($65 per hour / 60) . . . . . X_____

TOTAL for Situation #1 ($10) . . . . . =_____

Situation #2: Interrupt Secretary:

Number of files that are printed on high quality printers per month per PC not connected to a high quality printer: (40) . . . . . X_____

% of time user of a terminal / PC is interrupted (25%) . . . . . X_____

% of time user is a secretary is interrupted (70%). X_____

Average time spent stopping tasks, waiting for file to be printed and restarting tasks by person interrupted: (3 min.) . . . . . X_____
Labor rate for Secretaries: ($35 per hour / 60) . . X_____
TOTAL for Situation #2 ($12) . . . . . =_____

C. **SUMMARY OF COST SAVINGS (A - B ABOVE):**

1. Professional User who does not interrupt others ($227) . . . . . _____
2. Professional User who interrupts others ($173). . . . . +_____
3. Interrupted person - Business Professional ($10). . . . . +_____
4. Interrupted person - Secretary ($12). . . . +_____
5. SUBTOTAL ($422) . . . . . =_____
6. Number of PCs connected to system (20). . . X_____
7. Number of months per year (12) . . . . . X_____
8. TOTAL SAVINGS ($101,280). . . . . =_____

D. **Potential Sales gains as a result of professional documents being sent to the customer:**

Sales ($500,000). . . . . _____
Potential sales gains from professional looking documents (% of sales): (.05%) . . . . . X_____
Profit Margin on sales (% of Sales) (10%) . . . . . X_____
TOTAL potential sales gains ($2,500). . . . . =_____

DATA BACKUP:

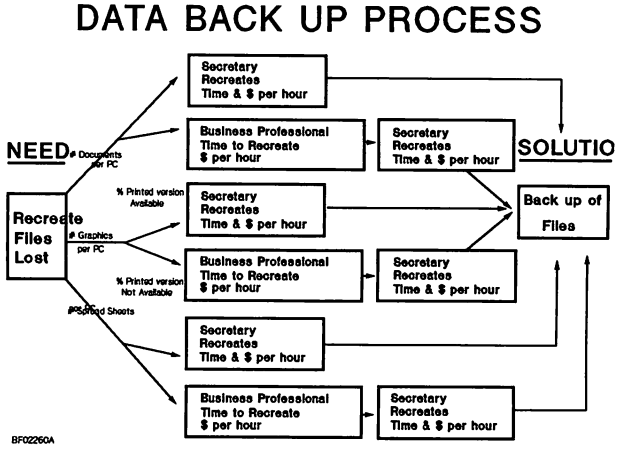
Data backup provides reliable and secure backup on PC hard disc data. To assess the value of this backup, estimate the probability and cost of losing PC data. The following sections detail the costs in recreating text documents, graphs and spreadsheets. There is also a place for valuing PC applications like Lotus 1-2-3 which would need to be repurchased in situations where a hard disc is completely erased. It is assumed that:

1. Secretaries have more graphs on their systems than spreadsheets - figures will need to be adjusted based upon your organization's mix.

2. Drawings do not change as frequently as documents and therefore a copy is more likely to be the current one.

3. In recovering files (documents, graphs, drawings and spreadsheets) it is assumed that the secretary will perform as much data entry as possible while the business professional will evaluate and perform the recreation of the content.

4. There will be various degrees of recreation required.



I. NEED DETERMINATION QUESTIONS:

A. High Level:
1. How much is the data / information worth to you?
2. Will any decisions be affected by not having it when needed?

B. User Level:
1. What would you do if you lost all the data on your hard disc?
2. Could you recreate all the data?
3. Are you sure that you could recover it correctly?

II. WORKSHEET:

A. Savings in Dollars for Recreating Documents (per PC):

Situation #1: Printed version not available:

Average Number of Documents on 20MB Hard Disc: (50) . . . . . _____
% of them that would need to be 100% recovered: (50%) . . . . . .X _____
Average number of lines per document: (300) . . .X _____
Time per line to re-enter from printed version: (30 sec. / line.) . . . . . .X _____
Labor rate for Secretaries: ($35 per hour / 3600) .X _____
Subtotal Cost for Secretary ($2,187) . . . . . .= _____

Average Number of Documents on 20MB Hard Disc: (50) _____
% of them that would need to be 100% recovered: (50%) . . . . . X_____
Business Professional time required to recreate document content: (3 hours per document) . . . X_____
Labor rate for Business Professional ($65 per hour) X_____
Subtotal Cost for Business Professional ($4,875) . =_____

Subtotal Cost for Secretary ($2,187) . . . . . _____
Subtotal Cost for Business Professional ($4,875) . +_____
Total Dollar Savings for those documents where printed version is not available ($7,062) . . . =_____
% of documents where a current copy is not available: (10%) . . . . . X_____
TOTAL for Situation #1 ($706) . . . . . =_____

Situation #2: Printed version available:

Average Number of Documents on 20MB Hard Disc: (50) . . . . . _____

% of them that would need to be 100% recovered: (50%) . . . . . X_____

Average number of lines per document: (300) . . . . X_____

Time per line to re-enter from printed version: (30 sec. / line.) . . . . . X_____

Labor rate for Secretaries: ($35 per hour / 3600) . X_____

% of documents where a current copy is available: (90%) . . . . . X_____

TOTAL for Situation #2 ($1,969) . . . . . =_____

B. Savings in Dollars for Recreating Graphs / Drawings (per PC):

Situation #1: Printed version not available:

Number of Graphs or Drawings on 20MB Hard Disc (10) . . . . . _____

% of them that would need to be 100% recovered: (50%) . . . . . X_____

Time per graph or drawing to recreate from a printed version: (1 hour) . . . . . X_____

Labor rate for Secretaries: ($35 per hour) . . . . . X_____

Subtotal Cost for Secretary ($175) . . . . . =_____

Number of Graphs or Drawings on 20MB Hard Disc (10) . . . . . _____

% of them that would need to be 100% recovered: (50%) . . . . . X_____

Business Professional time required to recreate a graph and/or drawing content: (30 min. per graph or drawing) . . . . . X_____

Labor rate for Business Professional ($65 per hour / 60) . . . . . X_____

Subtotal Cost for Business Professional ($163) . . =_____

Subtotal Cost for Secretary ($175) . . . . . _____

Subtotal Cost for Business Professional ($163) . . +_____

Total Dollar Savings for those graphs / drawings where a printed version is not available ($338). =_____

% of graphs and drawings where a current copy is not available: (5%) . . . . . X_____

TOTAL for Situation #1 ($17) . . . . . =_____

Situation #2: Printed version available:

Number of Graphs or Drawings on 20MB Hard Disc (10) . . . . . _____

% of them that would need to be 100% recovered: (50%) . . . . . X_____

Time per graph or drawing to recreate from a printed version: (1 hour) . . . . . X_____

Labor rate for Secretaries: ($35 per hour) . . . . X_____

% of graphs and drawings where a current copy is available: (95%) . . . . . X_____

TOTAL for Situation #2 ($166). . . . . =_____

C. Savings in Dollars for Recreating Spreadsheets (per PC):

Situation #1: Printed Version not Available:

Number of Spreadsheets on 20MB Hard Disc (5). . . . _____

% of them that would need to be 100% recovered: (50%) . . . . . X_____

Time per spreadsheet to recreate from a printed version: (30 min.) . . . . . X_____

Labor rate for Secretaries: ($35 per hour) . . . . X_____

Subtotal Cost for Secretary ($44) . . . . . =_____

Number of Spreadsheets on 20MB Hard Disc (5). . . . _____

% of them that would need to be 100% recovered: (50%) . . . . . X_____

Business Professional time required to recreate spreadsheet content: (3 hours per spreadsheet). X_____

Labor rate for Business Professional ($65 per hour / 60) . . . . . X_____

Subtotal Cost for Business Professional ($488) . =_____

Subtotal Cost for Secretary ($44) . . . . . _____

Subtotal Cost for Business Professional ($488) . . +_____

Total Dollar Savings for those graphs / drawings where a printed version is not available ($532). _____

% of spreadsheets where a current copy is not available: (10%) . . . . . X_____

TOTAL for Situation #1 ($53). . . . . =_____

Situation #2: Printed version available:

Number of Spreadsheets on 20MB Hard Disc (5). . . . _____
% of them that would need to be 100% recovered:
(50%) . . . . . X_____
Time per spreadsheet to recreate from a printed version: (30 min.) . . . . . X_____
Labor rate for Secretaries: ($35 per hour / 60) . . X_____
% of spreadsheets where a current copy is available: (90%) . . . . . X_____
TOTAL for Situation #2 ($39) . . . . . =_____

D. Cost of Software to Recover per PC:

Average cost per copy to get replacements: ($500) . _____
Average number of copies per PC: (3) . . . . . X_____
TOTAL for Cost of Software to Recover per PC ($1,500) . . . . . =_____

E. SUMMARY OF COST SAVINGS (A - D PREVIOUS PAGE)

1. Labor Savings for recovering documents:
   a. Printed version not available ($706). . _____
   b. Printed version available ($1,969). . . +_____
2. Labor Savings for recovering graphs / drawings:
   a. Printed version not available ($17) . . +_____
   b. Printed version available ($166) . . +_____
3. Labor Savings for recovering spreadsheets:
   a. Printed version not available ($53) . . +_____
   b. Printed version available ($39) . . . . +_____
4. Cost of software to recover ($1500) . . . . +_____
5. SUBTOTAL ($4,450) . . . . . =_____
6. % probability of a disc crash and loosing data (5%) . . . . . X_____
7. Number of PCs connected to system (20). . . X_____
8. TOTAL SAVINGS ($4,450). . . . . =_____

F. Average estimated contributions to profits as a result of timely information for decisions per PC per month from:

NOTE: Every document, graph, drawing, spreadsheet has value and should contribute to profits - otherwise, why was it created?

Documents: ($100) . . . . . _____
Graphs / Drawings: ($100) . . . . . +_____
Spreadsheets: ($100). . . . . +_____
TOTAL for Contributions to Profits ($300) . . . . . =_____

ELECTRONIC MAIL:

Some changes involve standardization. While there is a cost to individual freedoms from standardization, there are also benefits that accrue to the organization. These need to be weighted and understood. If everybody is expected to use electronic-mail then this constraint will cause a change in behavior. However, it will have greater value. Imagine the total value to installing an electronic-mail system where only one one person ever uses the system. Sending messages to yourself has little value. The real value is a result of a total workgroup or organization using the system. If you send a message to someone and they never read their mail then your message is lost.

HP has experience in using electronic mail networks. It is estimated that HP's electronic mail network is between the 7th and 8th largest in the U.S. in terms of registered users.

The use of HPDeskManager has increased to such an extent that it is now the communication backbone for Hewlett Packard with over 65,000 registered users on the network. It costs approximately $58 per month per registered user.

Our average delivery time anywhere in the world is 7 hours using "normal service" and one hour using "urgent service". What value does this have to an organization? The time value of information needs to be considered.

The average cost per page is $.61. The average number of recipients per message is 2.075. The cost per recipient is $.29.

The Interactive Office Systems Group, which is responsible for the internal implementation of HPDeskManager calculated the costs of sending information between HP offices using a variety of different media. The costs which were included in this analysis covered depreciation, support, service, operations, facilities etc. to obtain a total cost for the service.

The comparative "dollar costs" for sending two pages of information per recipient using a variety of media are:

System	2 Pages	Rate
HP Interoffice Mail	$0.10	$0.30 per ounce
US Postal Service	$0.44	$0.44 per ounce
HP's HPDesk Network	$0.58	$0.29 per 4000 bytes
Public E-Mail Net 1	$1.60	$0.80 each 7500 bytes
Public E-Mail Net 2	$2.00	$1.00 each 7500 bytes
Fax	$3.20	$2.39 1st page, 0.81 each additional page
Express Mail	$10.00	1 - 30 pages for 10.00

The only mechanisms which are lower in cost for distributing information than HPDeskManager were "HP's interoffice mail" and the "US postal service". However they are much slower mechanisms for distributing information than HPDeskManager. Information has a time value to it. When document preparation time, photocopying time, and paper costs are included, these services are more cost comparable to HPDeskManager.

HPDeskManager was introduced to the U.S. sales force last year. Remote access to the system was made possible through the use of portable computers.

Richard S. Burgess, a HP marketing manager, was quoted in the Oct. 12, 1987 issue of Business Week on "HP's sales force automation project". He indicated, "We changed the way people communicate with their boss and peers". As a result of HP's project, time with customer's increased 27% and sales rose by 10% in the pilot group. Even if sales only rise by half as much, the 1700 reps that will become automated this year, will generate $30 million in pretax profits. This will be 5 times the project cost.

Other benefits from this project have been: greater sales-force enthusiasm, confidence and professionalism; increased creativity in performing their jobs; and a more team-minded spirit.

One company that sells a wide range of construction and home maintenance products installed electronic-mail services between its field sales staff and its headquarters. The result was instead of returning unsold inventory to the company, distributors around the country could communicate and ship products directly to areas that needed them. Swapping of returned goods increased by 70%, preventing lost profits of $70,000 per year. One-year ROI was 530% and 2,300% over five years.

For electronic mail, the following analysis focuses on basic benefits: reducing phone tag, verifying whether messages were received and sending messages. This analysis assumes that

users want messages as quickly as possible, and this translates into business benefits.

NOTE: While there are some benefits to electronic mail, the objective is to present a simplified approach on how electronic mail could be justified. There are many features of HPDeskManager that could be included in the analysis depending upon the application and industry.

I. NEED DETERMINATION QUESTIONS:

A. High Level:
1. Do your employees spend a significant amount of time playing "phone tag"? (an unproductive activity)
2. Are any decisions affected by not getting a simple answer in a timely fashion?
3. Is it important to you to have current information easily transferred between people within your organization?

B. User Level:
1. How many times do you call someone only to leave a phone message?
2. How many times do you need to assure that a message is sent and read by someone in a remote location?

II. WORKSHEET (from metrics above):

A. Labor savings in communication - phone tag:

Situation #1 - Simple response desired:

Number of pink slips generated per month by a PC user calling someone who was not at their desk (100) . . . . . _____

% of calls where a "pink slip" was generated when a simple response could have been created using electronic mail (20%) . . . . . X_____

Time it takes per call to create a pink slip: (2 minutes) . . . . . X_____

Labor rate for Business Professional: ($65 per hour) . . . . . _____

Labor rate for Secretaries: ($35 per hour) . . . . . +_____

Total combined labor to give and take message ($100 per hour / 60) . . =_____ -> X_____

Total labor savings in phone tag per PC / terminal user ($66). . . . . =_____

Situation #2 - Verifying message received or read:
Number of pink slips generated per month by a PC user calling someone who was not available (100). . . . . _____
% of calls where a "pink slip" was generated where the purpose was to verify that the message was read or received (10%) . . . . . X_____
Time it takes per call to create a pink slip: (2 minutes) . . . . . X_____
Labor rate for Business Professional: ($65 per hour) . . . . . _____
Labor rate for Secretaries: ($35 per hour) . . . . . .+_____
Total combined labor to give and take message ($100 per hour / 60) . . .=_____ -> X_____
Total labor savings in phone tag per PC / terminal user ($33). . . . . =_____

B. Labor savings in communication - sending messages:

Creating labels, stuffing envelopes, etc. (1 minute)._____
Number of messages (newsletters, standard reports, expense reports, sales figures) that need to be sent per person: (100) . . . . . X_____
Average number of people who need to be copied per message: (5) . . . . . X_____
Secretary time per message to copy it for distribution (going to copier, waiting for someone else to finish copying, actual copy time): (2 minutes) . . . . . X_____
Labor rate for Secretaries: ($35 per hour / 60) . . X_____
Total cost of sending messages per month per PC user ($875) . . . . . =_____

C. Material costs in sending messages by mail:

Number of messages that need to be sent per month per person: (100) . . . . . _____
Average number of people who need to be copied per message: (5) . . . . . X_____
Cost of mailing correspondence using the post office (including envelope, stationary, stamps, mail room costs, etc.): ($1.00 per letter). . . . . X_____
Total material cost per PC user ($500). . . . . =_____

D. Additional savings in communication - sending messages that need to be sent overnight:

Additional Labor Savings:
Number of messages that need to be sent per month per person: (100) . . . . . _____
Average number of people who need to be copied per message: (5) . . . . . X_____
% of messages that need to be sent overnight (5%) . X_____
Secretary processing time (5 minutes per message) . X_____
Labor rate for Secretaries: ($35 per hour / 60) . . X_____
Total cost of sending messages per month per PC user ($73) . . . . . =_____

Additional Processing Costs:
Number of messages that need to be sent per month per person: (100) . . . . . _____
Average number of people who need to be copied per message: (5) . . . . . X_____
% of messages that need to be sent overnight (5%) . X_____
Federal Express Costs per message ($10) . . . . . X_____
Total cost of sending messages per month per PC user ($250 . . . . . =_____

E. COST SUMMARY:

1. Labor savings in phone tag - simple response desired ($66) . . . . . _____
2. Labor savings in phone tag - verifying message received or read ($33) . . . . . +_____
3. Labor savings in sending messages ($875). . +_____
4. Material costs in sending messages by mail ($500). . . . . +_____
5. Additional savings in sending messages overnight ($250) . . . . . +_____
6. SUBTOTAL ($1,724) . . . . . =_____
7. Number of PCs connected to system (20). . . X_____
8. TOTAL SAVINGS ($34,480) . . . . . =_____

GRAPHICS:

According to Computer Graphics World, presentations using visual aids were 43% more persuasive than unaided presentations. Persuasion has value and can have an impact on an organization's bottom-line. An increase of 43% in persuasion can result in a positive impact on an organizations bottom line. What if you could sell 43% more of your customers on buying your products resulting in a 43% increase in sales. A company with sales of $1 million and a ratio of net-earnings to sales of 8% could expect an increase of $430,000 in sales and an increase in net earnings of $34,400.

MANAGEMENT CONCERNS:

While office automation can be justified as seen above, there are some concerns that need to be addressed.

Three questions that a "management cost justification" should address are:

* How much is going to be saved?
* How accurate is the analysis?
* How soon will the results be achieved?

By increasing the efficiency of how people work in organizations, time can be saved. By investing the time-saved effectively, tasks can be added that contribute to the organization's bottom-line.

In situations where office people are working 60 hours per week, one can assume that this is approaching their limit. Any increase in work will probably necessitate an increase in staff. When situations such as this occur, the costs of hiring additional people needs to be addressed. These costs can become a real expense.

IMPLEMENTING OFFICE AUTOMATION PROJECTS:

While it can be seen that Office Automation can be cost-justified, in order to achieve the results it is important to have a successful implementation.

The following are some guidelines on how to successfully implement an Office Automation project:

1. **Plan ahead.**
Real office productivity comes form changing work processes and eliminating unnecessary steps, not just speeding up work.

2. **Involve top management.**
In order to maximum the implementation benefits, top management support should be obtained. This is important for office automation implementations that span organizational boundaries.

3. Be selective.
Identify one or two well defined tasks that are critical to your company's mission and make sure the objective is measurable. Don't give everyone computers at first. Target the 20% who can assure the success of your initial experiments. The other 80% will follow.

4. Be patient.
Learning curves need to be considered. Technology will change your organizations culture. Employees need time to adjust to different ways of doing work.

5. Measure the benefits.
Doing things faster is a change, but not necessarily a benefit. Monitor whether the technology alters behavior, assess whether that is good, and calculate the value of that change. Figure where the time went. Sometimes the greatest payoff comes from doing a better job, not from just reducing staff.

6. Communicate.
Tell your employees why you want to automate and get their help in doing the job. Changing behavior is a difficult task. However, when the advantages become understood and the value internalized, changes are easier to incorporate.

SUMMARY:

As a result of this paper and analysis, I hope that you find some techniques that will help you in your office automation justification efforts. I really believe that when properly addressed, Office Automation can be justified and make a positive contribution to an organization and the company's bottom-line. I hope that you would try the techniques. The HP field sales organization has access to additional Office Justification Worksheets that can also help you.