Business Presentation Graphics for Micro Computers

'Pictures Worth More Than A 1000 Words'

An Honors Thesis (ID 499)

by

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May 1986

Expected graduation date: Spring 1986
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I. Project Outline

This Thesis project was designed to grant me a thorough understanding of graphics in the micro-computer market. It is composed of four parts. In the first part, I researched and wrote a short paper on the topic. In order to understand more of what I was just reading about, I developed an evaluation form and analyzed ten graphics packages owned by Ball State University. These evaluations appear in the Appendix. Visits to three outside businesses plus Ball State's Finance Department, completed my view of today's graphics applications. A short summary wraps up my findings and sample outputs also appear in the Appendix.
II. Research Paper

A graph is formally defined as "any pictorial device ... used to display numerical relationships."[1] Graphics have long been used to condense data into images that are both more dramatic and effective than number tables or text. These images were formerly hand-created by graphic artists. But the computer-age has arrived and the proliferation of personal computers today has encouraged wider applications of these powerful tools. PC's running graphics software allow users to create their own visual aids at lower costs and with greater speed and control of the final image. Revisions and refinements, once too costly or time-consuming when sent to the graphics department, are now possible.

Few people question, however, whether the quality of a computer-generated image is comparable to a graphic-artist's image. Today many people are questioning whether "a picture worth a 1000 words is worth 1000 dollars."[2]

There are two categories of business graphics, each designed for different purposes. The first type is Decision-Support graphics. These are also sometimes called


Personal or Peer Graphics as they are primarily used for internal decision making, not external communication. The packages are designed as an on-line function connected to data base or spreadsheet files. The graphs are typically displayed on-screen rather than printed as hard copy and the emphasis is on creation-speed rather than on output-quality. "Being able to transfer quickly between two views of the same data can stimulate thinking and speed the ability to draw conclusions."[3]

Presentation graphics is the second and currently the largest type of graphics. As the name states, these graphs are created to accompany presentations and reports via slides, overhead transparencies or hard copy output. Since they are typically shared with important people, such as clients, top management and stockholders, there is an emphasis on a quality appearance. A variety of colors, text fonts and high resolution screens are some of the special features which take precedence over the ease of production.

When people refer to business graphics they are in essence referring to presentation graphics. Most businesses today, both profit and non-profit, private and public, have heeded the advice contained in a 1982 study by the Wharton Business School. Results stated that "presenters who used visuals won the points 67% of the time and were perceived as

more professional. When no visuals were used, decisions were often deadlocked."[4]

Professionals who incorporate such visual aids in their presentations are clearly the most effective. Other studies indicate that people retain only 10% of what they hear but 50% of what they see.[5] It is primarily a matter of cutting through a barrage of details and presenting only the main themes so the audience may remember the vital information. The Wharton study can be cited as a primary catalyst in the surge of business graphics packages. Businesses unable to afford establishing their own graphics department or the expense of using an outside graphics house have turned to their own computer resources.

There are four reasons why graphics software is suddenly taking off.[6] Until recently, good quality hardware and software were hard to find. The technology simply did not exist. The second reason is the lower costs. Graphics systems for a mainframe that sold for $100,000 five years ago may now be found on a PC for about $15,000. The third reason is that manufacturers have discovered that the majority of their users are not "teckies"[7] but executives


7ibid, pg. 3.
with limited computer skills. Thus, the packages are now
designed to be as user-friendly as possible. The last
reason is the reduction in learning time. Busy executives
could not afford to spend 40-80 hours learning the commands
to run a graphics program. Simplified menus allow casual
programmers to produce quality images quickly.

Software Selection.

Graphics packages for micro-computers are a relatively
new item. In fact, the very first package, called "Tiny
Troll" was issued in 1979,[8] just seven years ago. Since
that time, however, the packages have become increasingly
sophisticated and flexible. There is even some controversy
today over whether the quality of micro-based images
matches that of mainframes. One spokesperson remarked,
"It's just a matter of time before the difference between
micro and mainframe graphics becomes indistinguishable."[9]

Experts do agree that there are specific applications
which are better suited to a micro package over a mainframe.
The interactive nature of PC packages makes them best for
creating and editing specialized graphs. Large production
orders are still best satisfied on a mainframe.

These general types of application are what dictates a
company's equipment decisions. It is critical to note here
the importance of an organized selection process for both

Decisions, pg. 79.
hardware and software needs. With the variety of paraphernalia on the market today, haphazard purchasing will only result in a non-unified and probably non-functioning graphics system.

Two preliminary steps in the software selection process are discussing corporate objectives and defining a clear statement of purpose for the system. According to Doug Neal, Senior V-P Data Resource Corporation, users buy graphics software for three reasons:

1. Flat automation - accomplish a task in less time and/or fewer people.

2. Improved quality - perform a task in a better way.

3. Strategic consequences on the business - guaranteeing the company will exist in future years.[10]

A third step in the selection process is specifying the functions that would best suit the users of the system. For example, there are several types of Presentation graphics packages which include: chart/graph, draw/paint, text, predrawn clip art and enhancement software. A marketing department might use a painting package to illustrate stages in product development, while the accounting department would use charts to better analyze trends and figures. These packages come in varying levels of sophistication for occasional to dedicated users.

All of these packages may also be divided into two groups: stand-alone and integrated. Stand-alone packages

usually offer more options, such as text fonts and color patterns, but have a major disadvantage in ease of application. Numerical data must be first stored in a spreadsheet or DB file, then the graphics program loaded and the data transferred. Sometimes this means reentering the data manually if the package does not integrate successfully.

Integrated packages have a distinct advantage in direct entry of data from the package's own files. Most important, though, is the idea that users are "more likely to use the graphics in an integrated program just because they're there".[11] These packages are relatively new to the market and a 1986 report by DataPro Research Corporation revealed only a seventeen percent usage rate in the market.[12] Reasons cited for this low response included the higher costs, the lack of need for all package components, and the higher memory allocations. Also cited was the idea that many integrated packages are not as easy to use as they are promoted to be.[13]

A fourth step in selection is determining the type of output desired. There are three major categories: hard copy output, overhead transparencies and 35 mm slides.


Hard copy or paper output is produced by both plotters and printers. Plotters also produce overhead transparencies which are the most popular medium for presentations. One source stated that over 500 million would be prepared for 1985 alone.[14] They are useful in providing structure yet are flexible enough to permit discussion during meetings. Thirty-five mm slide shows are certainly effective and professional, but require expensive cameras or computer image recorders.

A new option is computer-screen slide shows. Special packages allow users to display stored images on the screen in any order. For small meetings this can be very effective and for larger groups, large-screen projection equipment can be utilized. As this type of equipment becomes more available in businesses and board rooms, users need only to carry their diskettes instead of a bulkier slide-tray. Two added bonuses to screen slide shows are: they allow animation and the image the audience will see is guaranteed.[15] Images are not always reproduced truly when transferred to other mediums.

The underlying consideration in selection is cost. If purchasing an expensive, multi-functional graphics package, one needs the resources or budget to support the desired output. Generally, more sophisticated applications require


more expensive hardware. Computer-image recorders, color plotters/printers and high resolution graphics cards cost thousands of dollars. Purchasers must first carefully weigh the expected use and benefits of such graphics. 'Is a computer screen and slide show feature mandatory or just desirable?' Another important question to ask is 'Will this system successfully integrate with the current office automation?'[16]

The key to micro computer software is the "run-as-it-comes"[17] policy. There is little scope for tailoring packages to specific systems and virtually no support for modifications. This helps keep industry costs down and sales volumes high.

This is why it is again important to stress the value in carefully defining the application. It can be considered an art to find the right program which will support most needs, lacking only in minor areas. There is a underlying caution against buying more than what is needed. Packages with excess capacity can be just as much trouble as not enough. They are more complex to handle, require additional hardware resources and are a greater burden on the staff. The capacity for future expansion and improvement must be carefully balanced against these factors.


If all of these considerations and performance factors are taken into account, a reliable decision should be made. Unfortunately, despite the variety of packages and equipment on the market today, there is no clear market leader to recommend. The National Computer Graphics Association (NCGA) states that there are more than 190 packages for the IBM PC alone and more are appearing each day.[18]

There is currently heated debate over the usefulness/popularity of dedicated graphics programs. The spreadsheet programs such as Lotus and SuperCalc3 seem to have an entrenched position. A survey of PC World readers indicated that 21% of the respondents are using 1-2-3 while the next two popular packages, Chartmaster and Microsoft Chart had only thirteen and fourteen percent respectively.[19] Many users find these limited graphics capabilities suitable to their needs and save the expense of acquiring an integrated program. But, I feel that this situation will change as businesses discover the advantages of using better quality graphic displays; and the interest in dedicated and sophisticated programs will increase. Also, again, purchasers will save the greater expense of an integrated package.


Most companies today are using a combination of programs in order to fulfill every application or need. The MIS department, which is charged with producing varied requests from managers, must have maximum flexibility in their system. Those that succeed may gain a "strategic edge that is the promise of so much technology."[20]

Visual Design Principles.

After selection, users must learn to operate the software package successfully. Fully learning its capabilities can be accomplished only through hands-on experimentation. Bolstering their "Visual IQ"[21] by reading articles and books will help users attain a grasp of what makes effective business graphics. Lastly, in designing graphs one should always follow a few general design principles.

Especially to novice graphers, software packages offer a seemingly endless array of options. 'Why not use everything?' is a prevalent attitude. The statement "visuals should support the presentation not be the presentation"[22] is an elementary criterion to remember. Two of the most common design errors are too much information packed in one image, and inconsistency or lack


of imagination.[23] These errors are generally solved through experience.

The three basic requirements for visuals are (1) accuracy (2) easily interpreted (3) have impact.[24] These are sometimes easier said than done. Images carry weight impact and any distortion of data can lead to poor decisions. Designers must take responsibility for selecting the most accurate format for the information displayed. "Distorted graphics can mask the facts, leaving you worse off than you were with piles of printouts."[25]

To be easily interpreted, graphs must have consistency (in color, fonts, size of text) and not be cluttered. To cut through the unimportant details and present the central idea is the major aim in using graphics.

Perhaps the hardest requirement is impact. Creating attractive and dynamic images is a factor of many things. Balancing impact and clutter can be difficult as the presenter wants to neither bore nor confuse the audience. The use of color is an important aspect. "People like to see color, and it has a strong effect on us whether we realize it or not."[26] Warm colors, such as reds, oranges and yellows, excite, while blues and greens are cool and


[26]ibid, pg. 259.
soothing. Finding attractive combinations is a process of trial and error.

The last important aspect is knowing the intended audience. Clever presentations can hold viewers' interest but "too-cute"[27] graphics may turn them off. The entire presentation may then be deemed silly and the designer could lose credibility. There is a full twelve point checklist for creating graphics (located in the Appendix A) compiled by Dona Z. Meilach from PC Week. Graphics can help meet the challenge in this competitive age but there is a central caution to learn the rules and follow them consistently.

Market Projections.

There are differing statistics and views on the use of business graphics today. A survey by Decision Resources Inc. concluded that, although PC graphics software is catching on, most managers (70%) use it only occasionally. Fifteen percent reported they use it frequently and only seven percent reported daily use. Divisions of a company reporting use were as follows: 1/3 Sales and Marketing, 1/3 Finance, 1/6 MS/DP, and 1/6 Factory Operations.[28]

The top two reporting departments, more than most, are feeling the tremendous pressures of today's society to make better decisions. Large amounts of money and even the


outcomes of the business may be at stake. Better decisions require more information and better ways of communicating it. This is what is fueling the demand for business graphics software.

For 1986, the total graphics market revenue is projected to be $6 billion.[29] This includes business graphics, engineering and CAD applications. According to a report by Future Computer, a Dallas-based market research firm, revenues for personal computer graphics in 1985 were $1.0 billion. This figure is projected to increase to $3.4 billion by 1990. Broken down in yearly unit sales, this is 2.5 million packages sold in 1985 and 12.2 million expected by 1990.[30]

Our society is becoming more and more visually oriented. And no one can deny that the amount of information available to us is increasing dramatically. According to several experts, the rate of growth for technical and scientific knowledge alone will soon jump to 40% per year.[31]

"No longer is business graphics a toy technology used to make spiffy reports and presentations for the sake of..."


"glitziness". The big news for today and in the future is that graphics is an effective tool and its power should not be underestimated.

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III. Project Summary

As can be seen by just this very small sampling of graphics packages, there is a huge variety of types, skill levels and output forms to fit almost any need. Charts, slides and layouts make both presentations and internal analysis more effective. They also save preparation time, allow quick editing, and permit close security; all at a lower cost than outside graphics houses or internal departments. The abundance of PC's has caused managers to want better access to corporate data and better access to graphics.

As business professionals become more attuned to using graphics both as presentors and analyzers, the sophistication of their graphics will also improve. The strategic application of these charts and displays is a major but, as yet, relatively unexplored field. I do not see an area in business where graphics cannot improve the effectiveness of decision making and communication.

From the comments on my evaluations, one can easily see that the market is far from perfected. There are still major problems and obstacles to overcome both by manufacturers and users. What is deemed 'Presentation Quality' is still the highly subjective viewpoint of each observer. What is attractive to some may be dissapointing to others.
Probably the biggest problem in producing graphics is the lack of standards which is a problem to many computer applications. Standards that do exist lack universal implementation. One may create a beautiful image, but if it can't be sent directly to the camera or printer, a special device driver program must be written to integrate the two. These can cost thousands of dollars.

What is needed is a concentrated effort by software engineers and systems designers to accept proposed standards such as the the Graphical Kernal System.[1] Users want to and should be able to utilize various applications with diverse peripheral units.

As I conclude this project, the last idea I would like to stress is that despite today's advanced technology and simplified software, creating graphics is far from an instantaneous process. Donald Frazier in his article, "Getting Pizzazz into Presentations," stated it thus:

If everything has been done correctly, the audience will see a slick, professional presentation. As for the time and work that went into making it, only the creator will know for sure.[2]


BIBLIOGRAPHY


Johnson, Floyd E. "Think Big Start Small." Infosystems, June 1985, pp. 40-44.


Appendix A:  

VISUAL DESIGN PRINCIPLES

Rule 1: One on one: Narrow each visual to one well-defined objective.

Rule 2: Simplicity: Small segments of the screen require plain symbols, fewer words, and non-cluttered patterns.

Rule 3: Text Style: Be consistent with case and layout throughout visual. If text is nature of content, then eliminate thin type; use Helvetica.

Rule 4: Composition: Limit each image graphic to one concept or combined series of closely related ideas. Maintain a balanced image perspective.

Rule 5: Use bold letters with shadow enhancement in a contrasting color.

Rule 6: Use symbols and graphs when the content and interpretation is uniform, instant and consistent.

Rule 7: Use bullets to accent your key ideas and to separate sub-thoughts.

Rule 8: Reveal lines progressively. This is useful when each text statement can be separated and revealed as individual lines of information.

Rule 9: When using text format, not more than six to eight lines for full screen and approximately five to six words per line is best for clarity.

Rule 10: Painting Format. Apply the following three guidelines: Simplicity in line and color is best; for screen images use 3 by 4 aspect ratio, and for slide images use 2 by 3 units ratio. Also remember to leave a 10 percent safe area at top and bottom if transferring the image to slide.

Rule 11: Color. Use dark background colors for separation of foreground information. Use contrasting colors for letters and text. A black shadow to the left of the letter is attractive and easy to read. Use colors with at least three units of separation and a maximum of eight. Use color and patterns for continuity of theme in presentations.
Appendix B: Software Evaluations

The following list of packages was evaluated using criteria adapted from two sources: *How to Buy Software* and a handout from the IUPUI Microcomputer Conference, April 1985.

* Framework

* Lotus 1-2-3 (both versions)

* Open Access

* PC Foil

* PC Graph

* PC Palette

* Picture It

* Storyboard

* SuperCalc3
SOFTWARE EVALUATION FORM: BUSINESS GRAPHICS

NAME: Framework (Limited Version)
COMPANY: Ashton-Tate Mcgraw-Hill Instructional Software
LIST PRICE: $695

STARTING UP

Is the program command or menu-driven? menu
Extent training time (low, mod, high)? mod
Documentation (bad, adequate, superior)? adequate
On-line help? yes

ENTERING TEXT

Acceptable character limit? yes
Placement (restricted or free)? restricted
Different sizes of text? yes
Number of font types? 4
Option to annotate data? yes

GRAPHICS AND SPECIFICATIONS

Graph Types Available: (mark 'x')
Bar -clustered x
-stacked x
-horizontal
Pie -unexploded x
-exploded x
Line x
Scatter (X,Y) x
Organization
Gantt
Area
Word

Scaling:
Options (limited or unlimited)? limited
Different scales for X & Y axes? yes
Flexible tick mark settings? no
Multiple Y-axes? no
Optional scale formats? no

Placement:
Overlay graphs in single chart? yes
Multiple graphs per page/screen? yes
EDITING

Preview graph on screen?  
Switch graph types using same data set?  
Picture automatically adjust for changes?  
Generally easy to edit?  

OUTPUT

Speed: (slow/fast)  
Creation time?  
Screen image plotting time?  
Output routines for:  
  Printer?  
  Plotter?  
Number of colors available?  

EXTRA FEATURES

Free-hand drawing?  
Slide-show option?  
Statistical capabilities?  
3-D graph option?  

EVALUATION COMMENTS:

Framework is an integrated package composed of four segments: Word processing, DB management, Spreadsheets and Graphics. It is a menu-driven package with nine menu listed at the top of the screen. The user must learn how to manipulate and handle many frames which overlap one-another on the screen like a stack of papers.

The graphics are not spectacular to say the least. There are several limitations. The program automatically labels the data and scales the y-axis; like it or leave it. Only one graph may be worked on per spreadsheet and editing can be a complicated process. For example the user must edit the formula, 
@DRAWGRAPH(Graphdem.b6: Graphdem.c14,col#,line#,"text")
just to enter the titles on the graph.

Database management options may be utilized with the graphics. For example, one may arrange the bars in a graph to run from highest to lowest by value. Variables may be ranked by profitability or in alphabe-
tic order. Text and graphics files may be combined in one picture for annotating information to the graph.

The package does have a presentation feature where the user may create an outline format. Text files, spreadsheets, and graphs may be included in the order desired and the entire document printed. With two more commands this outline is converted to a table of contents, complete with page numbers.

Framework has some nice features and interesting possibilities but I was never able to combine the segments correctly. The skimpy documentation and the very limited on-line help function were virtually useless. One needs to have plenty of time to devote to learning the tricks of this package.
SOFTWARE EVALUATION FORM: BUSINESS GRAPHICS

NAME: Lotus 1-2-3 (new release)
COMPANY: Lotus
LIST PRICE: $649

STARTING UP

Is the program command or menu-driven? menu
Extent training time (low, mod, high)? low
Docuementation (bad, adequate, superior)? adequate
On-line help? yes

ENTERING TEXT

Acceptable character limit? no
Placement (restricted or free)? restricted
Different sizes of text? no
Number of font types? 11
Option to annotate data? no

GRAPHS AND SPECIFICATIONS

Graph Types Available: (mark `x')
Bar -clustered
-stacked x
-horizontal x
Pie -unexploded x
-exploxed x
Line
Scatter (X,Y)
Organization
Gantt
Area
Word

Scaling:
Options (limited or unlimited)? limited
Different scales for X & Y axes? no
Flexible tick mark settings? no
Multiple Y-axes? no
Optional formats? yes

Placement:
Overlay graphs in single chart? no
Multiple graphs per page/screen? no
EDITING

Preview graph on screen? __yes__
Switch graph types using same data set? __yes__
Picture automatically adjust for changes? __yes__
Generally easy to edit? __yes__

OUTPUT

Speed: (slow/fast)
Creation time? __yes__
Screen image plotting time? __yes__
Output routines for:
   Printer? __yes__
   Plotter? __yes__
Number of colors available? 16

EXTRA FEATURES

Free-hand drawing? __no__
Slide-show option? __no__
Statistical capabilities? __no__
3-D graph option? __no__

EVALUATION COMMENTS

Lotus 1-2-3 is primarily a spreadsheet analysis tool. Its primary function is not graphics but capabilities for generating limited graphs are built into the program. Lotus graphs are generally not used as presentation materials but rather as decision support tools.

I had a chance to analyze both the old and new versions of 1-2-3 and compare the graphics capabilities. Lotus made a special point of adding on to the graphing capabilities on the urging of their users.

Major improvements included the addition of three more text fonts; bring the total to eleven. Pie graph wedges can now be exploded for emphasis. New command names of the Print Graph menu are more descriptive; for example, 'Settings Hardware' instead of 'Configure'. 'Graph Options Scale' allows a user to select the scale options for both x and y axes. The y-scale indicator allows the option of removing all scale markings. Dates may be specified for the x-axis.

There are still several limitations to 1-2-3 which set it back from other packages. Once created and saved, a graphics image may never again be viewed on
screen. If wanting to see it again, one must either recreate it or send the file to a printer. For internal purposes this may be an acceptable arrangement as one needs mainly to quickly verify trends and spot relationships for further study and consideration. If wanting hard copy output on the other hand, one must be sure the graph is perfect before saving to a disk. There is no last minute editing allowed.

The data is entered directly from a range of cells and text may be entered either from a cell or the keyboard. Text allowance is still limited on the new version of 1-2-3. If names are too long they are truncated. This is also true for exploded pie wedges whose label length is limited to six characters.

Overall, Lotus is a great program for beginning graphics. No other package in this range is easier to use. Lotus has been cited as a primary catalyst in the presentation graphics market. Once users discovered how easy it was, they soon exhausted the capabilities of this package and were ready to move on to more sophisticated functions. 1-2-3 and similar spreadsheet graphics like SuperCalc3 will continue to fill an important role in companies' internal graphics needs.
SOFTWARE EVALUATION FORM: BUSINESS GRAPHICS

NAME: Open Access
COMPANY: Software Products International
LIST PRICE: $695

STARTING UP

Is the program command or menu-driven? menu
Extent training time (low, mod, high)? high
Documentation (bad, adequate, superior)? adequate
On-line help? yes

ENTERING TEXT

Acceptable character limit? yes
Placement (restricted or free)? restricted
Different sizes of text? yes
Number of font types? 4
Option to annotate data? yes

GRAPHICS AND SPECIFICATIONS

Graph Types Available: (mark 'x')
Bar -clustered x
-stacked
-horizontal
Pie -unexploded x
-exploded
Line x
Scatter (X,Y)
Organization
Gantt
Area
Word

Scaling:
Options (limited or unlimited)? limited
Different scales for X & Y axes? no
Flexible tick mark settings? no
Multiple Y-axes? yes
Optional formats? yes

Placement:
Overlay graphs in single chart? yes
Multiple graphs per page/screen? yes
EDITING

Preview graph on screen? ______ yes
Switch graph types using same data set? ______ yes
Picture automatically adjust for changes? ______ yes
Generally easy to edit? ______ yes

OUTPUT

Speed: ______ (slow/fast)
  Creation time? ______ fast
  Screen image plotting time? ______ fast
  Output routines for:
    Printer? ______ yes
    Plotter? ______ yes
  Number of colors available? ______ 12

EXTRA FEATURES

Free-hand drawing? ______ no
Slide-show option? ______ yes
Statistical capabilities? ______ yes
3-D graph option? ______ yes

EVALUATION COMMENTS

Open Access is a complete integrated package composed of six modules on six separate disks. These are: Information management, Spreadsheets, Word processing, Graphics, Time management, and Communications.

There is a massive amount of documentation available which is needed to learn the six programs. I found these manuals difficult to wade through and there was no short demonstration run. All programs are entirely menu-driven and there is an on-line help function. There is also a function key overlay which saves time from referring to the manuals.

The graphics module accepts data from spreadsheet files, database files or the keyboard. There is a limited array of graph choices but sufficient for most applications. The 3D feature on the bar chart is especially noteworthy.

The package incorporates the newest graphics feature; the on-screen slide show. Up to thirty-two
images may be grouped in a `carousel' for later recall and display. The user may specify the length of pause between each slide.

Another nice feature is the ability to store created graphs in an ASCII format file. This allows the user to include these graphs in a document written in the word processing module.

Open Access uses a windowing concept to allow users to manipulate between various components of the package. This concept allows a user to combine several graphs on one page, each in a separate window. The module is fairly flexible in text and scaling, although the character limits for labels are small. The user has full control over the exact size, shape and location of the charts on the screen. There is a choice of colors, fill patterns and special characters to dress up the charts. Unfortunately, there is no free-hand drawing function to personalize the graphs.

Like all integrated packages, Open Access requires additional time to become a proficient graphics creator. There are six separate programs to learn instead of one but each is strong. In fact, Open Access is easily the best integrated package I viewed. But, again like all integrated packages, there is a dilution of its capabilities, especially in the graphics segment.
SOFTWARE EVALUATION FORM: BUSINESS GRAPHICS

NAME: PC-Foil; version 5.3
AUTHORS: Don Logan and Wally Anderson
LIST PRICE: Once evaluated may forward $35 to authors.

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GRAPHS AND SPECIFICATIONS

Graph Types Available: (mark `x')

- Bar -clustered
- stacked
- horizontal
- Pie -unexploded
- exploded
- Line
- Scatter (X,Y)
- Organization
- Gantt
- Area
- Word

Scaling: (Not Applicable)

- Options (limited or unlimited)?
- Different scales for X & Y axes?
- Flexible tick mark settings?
- Multiple Y-axes?
- Optional scale formats?

Placement: (Not Applicable)

- Overlay graphs in single chart?
- Multiple graphs per page/screen?
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**EXTRA FEATURES**

<table>
<thead>
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<th>Feature</th>
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<tbody>
<tr>
<td>Free-hand drawing?</td>
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</tr>
<tr>
<td>Slide-show option?</td>
<td></td>
</tr>
<tr>
<td>Statistical capabilities?</td>
<td>(Not Applicable)</td>
</tr>
<tr>
<td>3-D graph option?</td>
<td></td>
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</tbody>
</table>

**EVALUATION COMMENTS**

PC-Foil works with a companion program, Foil-Edit, to prepare complete presentation text documents. Foil-Edit is a general purpose, full-screen editor which supports program writing and word processing functions. It is menu and command driven depending on the user's skill level.

The document is thus created with this program and then printed using PC-Foil. Only textual documents can be created as there are no graphing capabilities.

For a freeware package, there is a surprising amount of documentation available. There is a moderate range of printer control commands that must be assimilated before any output can be created.

Output for presentation is produced as overhead transparencies, called foils, and as hard copy documents for reports. There are two font types available and eight sizes of text from small print (132 characters per line) to the largest of the big prints (20 characters per line). Users are able to create more dramatic...
effects with bold print styles, highlighting text and a special boxing capability.

The package does possess some useful characteristics and is easy to learn, but the user must possess plenty of time to spend playing around with the output. There are sometimes some wide discrepancies as to what appears on the screen and what is actually printed.
SOFTWARE EVALUATION FORM: BUSINESS GRAPHICS

NAME: PC-Graph
COMPANY: Softek
LIST PRICE: Ball State University Shareware

STARTING UP

Is the program command or menu-driven? menu
Extent training time (low, mod, high)? low
Documentation (bad, adequate, superior)? bad
On-line help? no

ENTERING TEXT

Acceptable character limit? yes
Placement (restricted or free)? free
Different sizes of text? no
Number of font types? 0
Option to annotate data? yes

GRAPHS AND SPECIFICATIONS

Graph Types Available: (mark `x')
  Bar -clustered
  -stacked
  -horizontal
  Pie -unexploded
  -exploded
  Line x
  Scatter (X,Y)
  Organization
  Gantt
  Area
  Word

Scaling:
  Options (limited or unlimited)? limited
  Different scales for X & Y axes? no
  Flexible tick mark settings? no
  Multiple Y-axes? no
  Optional scale formats? no

Placement:
  Overlay graphs in single chart? no
  Multiple graphs per page/screen? no
EDITING

Preview graph on screen?  yes
Switch graph types using same data set?  no
Picture automatically adjust for changes?  yes
Generally easy to edit?  no

OUTPUT

Speed: (slow/fast)  fast
Creation time?  fast
Screen image plotting time?  fast
Output routines for:
  Printer?  yes
  Plotter?  no
Number of colors available?  1

EXTRA FEATURES

Free-hand drawing?  no
Slide-show option?  no
Statistical capabilities?  no
3-D graph option?  no

EVALUATION COMMENTS

PC-Graph is an extremely limited and frustrating graphics package. It is designed to work in conjunction with PC-File III where all data to be plotted must originate. It will not handle hand-entered data or data from other formats.

As the only graph option available is a line graph, the package will only plot data from one field of the file. This makes correlating relationships impossible. And, as PC-Graph graphs either all or none of the specified file, the user must create special database reports containing only the information desired to be graphed.

The package does have some good points. It is simple and fairly easy to use, especially considering there is no documentation to speak of. From the main menu, the user chooses a file, specifies the data field to be graphed and configures the size of the graph along with its minimum and maximum values. The graph is immediately previewed on the screen.
The text can now be entered and here the package is surprisingly flexible. In the text mode, characters may be printed anywhere on the screen. Ironically, there may be impressive titles and comments for an unimpressive graph.

The last limitation of the package is the graphs ultimately created are not presentation quality. The lines connecting data points are jagged and look like steps. There are no point symbols to mark points for accuracy. If used for internal decision making, fancy titles and text are not needed as the user knows what he is graphing.

Thus, the package defeats itself in design alone. I also experienced several problems in running the program. Each time it encountered an error, the entire program dumped with no explanation. This left me with nothing to show for the work accomplished so far. I was required to start all over and reenter commands in a frustrating cycle.
SOFTWARE EVALUATION FORM: BUSINESS GRAPHICS

NAME: PC Palette
COMPANY: IBM
LIST PRICE: $39.95

STARTING UP

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<th>Question</th>
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<tr>
<td>Documentation (bad, adequate, superior)?</td>
<td>adequate</td>
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<td>On-line help?</td>
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</table>

ENTERING TEXT

<table>
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<th>Answer</th>
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</thead>
<tbody>
<tr>
<td>Acceptable character limit?</td>
<td>yes</td>
</tr>
<tr>
<td>Placement (restricted or free)?</td>
<td>free</td>
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<tr>
<td>Different sizes of text?</td>
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<td>Number of font types?</td>
<td>12</td>
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<tr>
<td>Option to annotate data?</td>
<td>yes</td>
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GRAPHS AND SPECIFICATIONS

<table>
<thead>
<tr>
<th>Graph Types Available: (mark `x')</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bar -clustered</td>
<td>x</td>
</tr>
<tr>
<td>-stacked</td>
<td>x</td>
</tr>
<tr>
<td>-horizontal</td>
<td></td>
</tr>
<tr>
<td>Pie -unexploded</td>
<td>x</td>
</tr>
<tr>
<td>-exploded</td>
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<tr>
<td>Line</td>
<td>x</td>
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<tr>
<td>Scatter (X,Y)</td>
<td>x</td>
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<tr>
<td>Organization</td>
<td></td>
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<tr>
<td>Gantt</td>
<td>x</td>
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<tr>
<td>Area</td>
<td>x</td>
</tr>
<tr>
<td>Word</td>
<td>x</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scaling</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Options (limited or unlimited)?</td>
<td>limited</td>
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<tr>
<td>Different scales for X &amp; Y axes?</td>
<td>yes</td>
</tr>
<tr>
<td>Flexible tick mark settings?</td>
<td>no</td>
</tr>
<tr>
<td>Multiple Y-axes?</td>
<td>no</td>
</tr>
<tr>
<td>Optional scaling formats?</td>
<td>yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Placement</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overlay graphs in single chart?</td>
<td>yes</td>
</tr>
<tr>
<td>Multiple graphs per page/screen?</td>
<td>no</td>
</tr>
</tbody>
</table>
EDITING

Preview graph on screen? yes
Switch graph types using same data set? yes
Picture automatically adjust for changes? no
Generally easy to edit? yes

OUTPUT

Speed: (slow/fast) fast
Creation time? fast
Screen image plotting time? fast
Output routines for:
Printer? yes
Plotter? no
Number of colors available? 4

EXTRA FEATURES

Free-hand drawing? yes
Slide-show option? yes
Statistical capabilities? no
3-D graph option? yes

EVALUATION COMMENTS

PC Palette is a three-disk graphics with three major functions. The first is to create and edit freehand drawings. The second is to plot business charts using numerical data. The third is to create dynamic slide shows using a file of previously created images.

The package is unique in that it supports four input devices: keyboard, joystick, mouse, and digitizer; all which may be used simultaneously. Output is designed primarily for screen slide-shows but may be output to a dot-matrix, graphic or color printers.

One entire disk is devoted to documentation and demonstration routines. The demo-run gives a quick and functional view of the package. There is an on-screen menu on the draw/plot function which is used to select pen size and color, scaling and other options. It is sometimes difficult to find the pointer arrow on this menu as the boxes are small and similarly colored. The icons are also difficult to interpret at first until the user becomes familiar with the package. There is a choice of only four colors which is not a rainbow but is sufficient for most internal purposes.
The business graphics capabilities are functional if not as elaborate as other packages. The charts are also somewhat more complicated to create. For example, on a pie chart, users must figure their own percentages and add the numerical text to the chart. Labels for the x-axis must be saved in a separate data file which is submitted with the numerical data file at the time of plotting. The user may change the axis range but not the scaling format.

The package does possess quite a few extra features which place it above the rest. Some of these include maps, business forms, organizational charts, house layout plans and an Art Library. There is free text placement on labels and titles and twelve optional font types although only four are active at one time. Three dimensional shadows can be cast on both text and graphics.

One of the most unique features of this package is the capability to save created images as either dot or stroke files. The benefits of this are user control of storage space and the ability to combine PC Palette graphics with graphics created from other programs. These may then all be combined in the PC Palette Show program.

Thus, this package with its low price tag has much to offer. Each of the functions may not be as detailed as a dedicated program would be but there are definite advantages in having them combined in one package.
SOFTWARE EVALUATION FORM: BUSINESS GRAPHICS

NAME: PC Storyboard
COMPANY: IBM
LIST PRICE: $250

STARTING UP

Is the program command or menu-driven? ____________________________
Extent training time (low, mod, high)? ____________________________
Documentation (bad, adequate, superior)? ____________________________
On-line help? ________________________________________
both mod superior

ENTERING TEXT

Acceptable character limit? _________________________________________
Placement (restricted or free)? _______________________________________
Different sizes of text? _____________________________________________
Number of font types? _____________________________________________
Option to annotate data? ___________________________________________
yes free yes-5 4 yes

GRAPHS AND SPECIFICATIONS

Graph Types Available: (mark 'x')
Bar -clustered -stacked -horizontal
Pie -unexploded -exploded
Line
Scatter (X,Y)
Organization
Gantt
Area
Word

x x x x x x

Scaling:
Options (limited or unlimited)? _____________________________
Different scales for X & Y axes? _____________________________
Flexible tick mark settings? _____________________________
Multiple Y-axes?
Optional formats? _____________________________

limited no yes no yes

Placement:
Overlay graphs in single chart? _____________________________
Multiple graphs per page/screen? _____________________________

no yes
EDITING

Preview graph on screen?  yes
Switch graph types using same data set?  yes
Picture automatically adjust for changes?  yes
Generally easy to edit?  yes

OUTPUT

Speed: (slow/fast)  fast
Creation time?  fast
Screen image plotting time?  fast
Output routines for:
  Printer?  yes
  Plotter?  no
Number of colors available?  16

EXTRA FEATURES

Free-hand drawing?  yes
Slide-show option?  yes
Statistical capabilities?  no
3-D graph option?  yes

EVALUATION COMMENTS

PC Storyboard is a package designed for presentations exclusively. These are computer controlled and can be shown directly on a monitor, projected on a video projector or transferred to other media such as video tape, slides or paper.

The package consists of four components located on four disks. The first is the Picture Taker. This allows contents of screens from other packages to be taken and saved for later inclusion in a story. Picture Maker is the heart of the package. It is used to create original pictures and edit stored images. There are several options in this module which include free-form drawing, business charts, and pre-drawn clip images. This package also creates great word graphs. There are four typefaces, each in five sizes. Further options allow italicized, shadow or outlined characters. Together there is a palette of fonts to create.

In this module, Storyboard adds a few extra features. There are four types of cursors from invisible to very large to use in creating. The zoom option and two scales for alignment are helpful in precise drawing. Any object can be filled with colors or
patterns chosen from the on-screen color table. There is a choice of nine print patterns for output on a monochrome printer and more than ninety-one selectable colors and half-tone shades on a four-color printer. Output on a composite (TV) screen is limited to sixteen shades.

The third and fourth components are the Story Editor and the Story Teller. These put the show together and then run it. Special display techniques add class to Storyboard's shows. There are seven methods of moving form frame to frame including: Fade, Explode, and Weave.

In all, the package was simple to work with. A complete step-by-step guide to creating images was easy to follow. There are a number of keyword commands though, which are difficult to keep straight and some sort of template or reminder card would have been useful.

In working with business charts, there are a few limitations. All data must be entered directly from the keyboard which is not effective for large quantities of numbers. There are also only a few graphing options. Users can get around these fairly easily by importing more complicated graphs into the area with Picture Taker. They may then be dressed up with special text, clip art or free-hand drawing.

Storyboard is a dedicated package and as such has limited applications in all businesses. The package is put together quite well and has some great potential if utilized in the right applications.
SOFTWARE EVALUATION FORM: BUSINESS GRAPHICS

NAME: Picture It 2.0
COMPANY: General Parametrics Corporation
LIST PRICE: $595

STARTING UP

Is the program command or menu-driven? menu
Extent training time (low, mod, high)? low
Documentation (bad, adequate, superior)? superior
On-line help? yes

ENTERING TEXT

Acceptable character limit? yes
Placement (restricted or free)? free
Different sizes of text? yes
Number of font types? 8
Option to annotate data? yes

GRAPHICS AND SPECIFICATIONS

Graph Types Available: (mark 'x')
Bar -clustered x
-stacked x
-horizontal x
Pie -unexploded x
-exploded x
Line x
Scatter (X,Y) x
Organization x
Gantt x
Area x
Word x

Scaling:
Options (limited or unlimited)? limited
Different scales for X & Y axes? yes
Flexible tick mark settings? yes
Multiple Y-axes? yes
Optional formats? yes

Placement:
Overlay graphs in single chart? yes
Multiple graphs per page/screen? yes
EDITING

Preview graph on screen? yes
Switch graph types using same data set? yes
Picture automatically adjust for changes? yes
Generally easy to edit? yes

OUTPUT

Speed: (slow/fast) fast
Creation time? fast
Screen image plotting time?
Output routines for:

Printer? yes
Plotter? yes
Number of colors available? 1000

EXTRA FEATURES

Free-hand drawing? no
Slide-show option? yes
Statistical capabilities? no
3-D graph option? yes

EVALUATION COMMENTS

Picture It is the graphics software package designed for the Videoshow hardware system by the same company. It is a multi-level package designed to accommodate all skill levels but its support for beginners is phenomenal. Picture It is definitely the most user-friendly package I have ever worked with. A tutorial, help-screens and a four color user's guide all provide easy to follow documentation.

The user has a choice of a wide array of graph formats, from line and area graphs to Gantt and word charts. There are eight text formats with optional shadowing, underlining and outlining effects. Labels may be placed about anywhere on the screen. There are twenty programmed background displays, one of which is the color 'None'. This is a transparent background used to overlay multiple images on a single graph. Of the 1000 available colors, twenty-four may be called by name while the others are specified using a 3-digit code. Exact shading is thus possible and is an important criteria for presentations.

The system is easy and even fun. All one must do is fill in the blanks. There are some limitations in this simplified format. Once the system is learned,
the intricate and well-designed menus may become restricting. In the text format menus, the program allows the user to enter more characters than their finished image will hold. Titles and labels are thus truncated. On the pie charts, the user must carefully choose the order of the wedges as too many small pieces side by side cause the labels/values to overlap.

The package may be run on any 256K, 8086-based graphics computer but, what makes Picture It the best is the hardware system. Videoshow, priced at a mere $3499, consists of a console, a video projector and an optional 35 mm camera. The console is able to display all 1000 colors and has a resolution five times greater than a PC monitor.

The video projection unit weighs only sixteen pounds so a presenter may easily transport it anywhere and hook up to any color monitor, large screen video projector or color TV. A remote control keypad with built-in software routines allows absolute user controlled presentations. There is even an on-screen pointer which is controlled by the keypad to emphasize critical points.

Thus, the hardware and software together are an unbeatable combination. It is a totally new concept on the market today and looks to have great future. Its capabilities can be extended even further with the purchase of Videoshow support programs. These include such functions as free-hand drawing and statistics.

In analyzing the benefits in acquiring this system, one must carefully consider the likely applications and desired output. This package would not be helpful for internal decision making or any applications involving large quantities of numbers. These must all be hand-entered into the graph menus; a time-consuming and often error-introducing process. It would also hardly be cost effective for this purpose. If, on the other hand, high-quality presentation graphics are needed on a frequent basis, this system would certainly be a great value.
SOFTWARE EVALUATION FORM: BUSINESS GRAPHICS

NAME: SuperCalc3
COMPANY: Sorcim Corporation
LIST PRICE: $295

STARTING UP

Is the program command or menu-driven? menu
Extent training time (low, mod, high)? low
Documentation (bad, adequate, superior)? superior
On-line help? yes

ENTERING TEXT

Acceptable character limit? yes
Placement (restricted or free)? restricted
Different sizes of text? no
Number of font types? 8
Option to annotate data? no

GRAPHICS AND SPECIFICATIONS

Graph Types Available: (mark `x')
Bar -clustered x
-stacked x
-horizontal
Pie -unexploded
-exploded
Line x
Scatter (X,Y) x
Organization
Gantt
Area x
Word

Scaling:
Options (limited or unlimited)? limited
Different scales for X & Y axes? yes
Flexible tick mark settings? yes
Multiple Y-axes? no
Optional formats? yes

Placement:
Overlay graphs in single chart? no
Multiple graphs per page/screen? yes
EDITING

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<td>Preview graph on screen?</td>
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<td>yes</td>
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<tr>
<td>Picture automatically adjust for changes?</td>
<td>yes</td>
</tr>
<tr>
<td>Generally easy to edit?</td>
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OUTPUT

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<td>Plotter?</td>
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EXTRA FEATURES

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<tr>
<td>Free-hand drawing?</td>
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</tr>
<tr>
<td>Slide-show option?</td>
<td>no</td>
</tr>
<tr>
<td>Statistical capabilities?</td>
<td>no</td>
</tr>
<tr>
<td>3-D graph option?</td>
<td>no</td>
</tr>
</tbody>
</table>

EVALUATION COMMENTS

SuperCalc3 is a limited integrated package which is similar to Lotus. Its primary function is spreadsheet analysis but its graphing capabilities are extended.

There is a good ten-minute introduction pamphlet just for creating graphics. The documentation in the User's Guide is understandable and has good indexing but, the graphing information is split. One must continually flip back and forth between the Commands Section and the Learning Section.

Creating and editing graphs using SuperCalc is a simple process. The commands are similar to Lotus but the package has several helpful additions. First, graphs may be edited after they have been saved. They may be recalled alone or in conjunction with their corresponding spreadsheet. The user may change the global graphics settings and save these new settings as the program defaults. There is an option for point labels which identifies exact values and improves the accuracy of the graphs.

There is a color menu where up to ten colors may be coordinated. Users may develop their own personaliz-
ed numbering scheme and may specify varying pen widths of the same color on plotters.

Another useful feature is one which optimizes the presentation of the graph on the screen. It automatically sizes the various parts of the graph, including the amount of text, and changes the graph size accordingly. And instead of long text labels being truncated they are printed vertically instead of horizontally. Unfortunately, this optimizing capability does not extend to hard copy output. Several times, what fit on the screen did not fit on the printed page and was truncated. (See Appendix for examples).

One drawback of this package compared to Lotus is that all input to a graph must be contained in cells of the spreadsheet. There is no keyboard input. This includes labels, minimum and maximum scaling options, and the number of tick marks allowed.

Overall, I found the SuperCalc3 graphics to be among the best in spreadsheet packages. It is easy to use, has a wide variety of styles to graph and better options. SuperCalc has no option to annotate text data but these graphs may be merged with some word processing packages such as Word Perfect. It similarly can be used to create graphs of data from other packages such as General Ledger. The Super Data Interchange utility converts the data without rekeying.
Appendix C: Business Application Visitations

As part of this project, I was able to witness a variety of actual graphics applications in the business community. I discovered that each of these applications was unique to that business. The use of a specific graphics package or technique was dependent upon the type of audience they intended to reach and the type of data being used. This supports the idea that there is no one ideal and all-purpose graphics package on the market today. Businesses do use and will continue to use a combination of packages tailored to specific needs.

Ball State University

My first visit was with Karen Gilliam, Assistant to the Director of Finance. In October 1985, her department purchased the Videoshow hardware package and the compatible software, Picture It. As the department is responsible for presentations to board members, legislative sessions, and the outside community, such a system was deemed an appropriate expense.

The former method for creating presentation slides was a three-step process. Karen first used a SuperCalc package to make the graphs, entering all required data into the package spreadsheet. She then plotted the graphs using a HP plotter for hard copy output. Lastly, the plotted graphs were photographed and developed into 35 mm slides either by Ball State's Media Services or by an outside camera house.
Such a process was time consuming and frequently aggravating. Business graphs were limited and word graphs were impossible. The goals in purchasing the new system were to eliminate these aggravations and, at the same time, produce top quality output.

Thus far, Karen has been extremely pleased with the new system and has reported substantially increased productivity with professional-looking results. She was able to learn the process in one weekend well enough to produce a forty-page report.

Now that the department has the capability and it has been fully tested, they are planning several future uses. Some of these include: bi-monthly and monthly staff meetings, budget reports and even special requests from the President and Provost offices. For a full evaluation of the software package, please see the Evaluation section of this report.

Ball Hospital

My second visitation was with Mike Rhodes, Optical Media Supervisor at Ball Memorial Hospital. Far from learning more about computer graphics, I discovered the professional world of Optical Printing and Production. Mr. Rhodes is in charge of creating presentations for the hospital and a variety of outside businesses.

His device is a Marron-Carrel 1400 Animation Stand. It sells for approximately $25,000. This large-scale camera allows Mike to create virtually anything he imagines.
He can produce any type of font ever used and has a choice of between 100,000 and 200,000 colors. As with any truly creative process, it is exacting and time-consuming. At the high end, one unique slide required eighteen exposures and a total of eight hours to create.

He had a vast array of sample slides on display which included: word, line, and bar graphs, maps, and live imagery. These were all incorporated in a multitude of special effects. The clarity and color of the slides were the sharpest I've seen, probably due to the camera's 8000 line resolution.

Mike's job at the hospital is a fairly flexible one. Just like many new products, no one is quite sure of the camera's capabilities and thus, do not know what to request. As this is the only equipment of this type in the state, Mike has learned most of the techniques through trial and error. He considers it an ongoing educational process to show the hospital just what they may expect.

It was exciting to see the actual results of such time and effort incorporated in a twelve-projector, speaker support slide presentation for the Muncie Blood Bank. I became aware for the first time of not just how far computer graphics have come, but how far they have yet to go. There are a very few very complex and expensive systems on the market today which combine computer graphics with optical printing. The results are incomparable, but one
must also note that the applications of such systems are extremely limited at the present time.

Eli Lilly

During a recent visit to Eli Lilly's Marketing Department, I was introduced to one of their mainstay graphics packages. It is one part of a complete PC modeling package designed to increase the productivity of company salesmen. ZS Associates; a partnership of two Northwestern University professors, is marketing the package with a two-fold purpose. The first is to effectively allocate all company sales resources and the second is to find the optimum territorial alignment.

MAPS III is the third version of the ZS Manpower Allocation and Planning System, acquired in 1984. It uses spreadsheet data downloaded from the main data base to create regional and district display graphs. These maps are then used to interactively test alternative sales force and product mix strategies. After zooming into a targeted district on a map, results of the analysis affecting that area can be displayed graphically in line, pie and bar charts. Important criteria typically analyzed at Lilly include sales and profit consequences and sales force effort deployments across both products and markets.

These graphs are generally displayed only on screen for visual confirmation, but the system is connected to an Epson printer for quick hard copy if needed. The relative ease in learning and the prompt response time has allowed Lilly
marketing to review their markets and sales potential each day. Substantial increases in productivity of the department have been attributed to the package.

Ball Corporation

My last visit was with Karen McBride, Supervisor of Personal Computing at the Muncie headquarters of Ball Corporation. Although there were a few PCs in the building as early as 1982, the PC Resource Center is only two years old. Today, there are 375 PCs in the company offices with a conservative estimate of 1500 users. Of these, 20-25% are presentation graphics users, discounting Lotus graphics. This is a substantial percentage compared with national survey norms.

The center has a selection of nine packages with multiple copies which executives have access to at any time. These range from Lotus to Digital Resource packages to the latest version of Picture It. The center provides classroom instruction and informal demonstrations to keep the users informed on the latest available package and applications. Karen estimated that only five percent of their users can be classified as 'teckies'; those who show some initiative when working with computers. The other ninety-five percent just want to know the bare essentials to get them by. This makes providing user education a difficult process for the center. The purpose of the department is not to create graphics for Ball employees but, rather, to find the
Overhead transparencies are used although not as extensively as slides. VCR tapes are made for major presentations. The corporation uses a Sony projection system in its corporate office and also at other sites. It takes only a few seconds to hook up the portable Videoshow unit and begin the presentation.

Karen is currently reviewing the arrangement at Ball Corporation's Colorado offices. They report creating 200-300 slides per month. At this time, these are contracted to outside firms which is costing an incredible amount of money. Karen is recommending the purchase of two VideoShow units plus Picture It software. Karen estimated that the system will be up and running in two months and she can then turn to their Aerospace Center.

Presentation graphics are taking off, as Karen put it, "like wild fire". A major reason for this is the complete support by Ball Corporation's top-level management. The executives were so impressed with the quality images and the potential of graphics, the Resource Center gained instant approval for the purchase of VideoShow.

At the present time, Karen estimates that the centers graphics resources and capabilities will satisfy the company's appetite for only one year. Ball Corp. is not sitting back complacently but realizes that audiences are becoming increasingly sophisticated and they must be looking for new ways to satisfy these people.

Ball Corporation is looking specifically toward new
hardware and software, get it running and then move it out to the users.

It was hard to distinguish the most popular package at the company. At this time the Decision Resources series of Chart- and Sign-Master are both well known and respected. Storyboard is the least used package. Although it works well in an auditorium or small room setting, it was not good for more mobile presentations where slides are preferred.

The system gaining the most attention and use is Picture It/Videoshow, which I previously reviewed at Ball State University. What Ball Corporation liked best was the Photo Maker for 35 mm slides. The camera's 4000 line resolution is twice that of Polaroid Palette used to develop Chart- and Sign-master slides. "The results are like night and day" in the clarity of these presentations.

As Picture It is definitely geared toward visual presentations where Chart- and Sign-Master are great for hard copy output, it includes some extra features. For example, since there are only three available sizes of text, Picture It protects against using tiny text which the audience would be unable to read.

Hard copy output is important though. Ball Corporation uses HP laser printers which improve the quality/professional appearance of Picture It images tremendously. Hard copy is needed for people to proof their results; otherwise someone is required to come into the office and visually check the screen for errors.
hardware developments. They feel that software has about reached its limit. New chip technologies may soon allow PC processing boards to assume much of the picture generation work presently done by software. This will then free the software function for more sophisticated applications.

The next advanced application will be to take all the design work created on CAD (computer-aided-design) systems and put it into presentations. Ball Corporation's Colorado's offices are already asking about this capability. Digitizers and scanners are also expected to become a new major area for graphics input.

Ball Corporation and its PC Resource Center certainly appear to be on the graphics bandwagon. They are taking full advantage of current market capabilities with exceptional results and are equally prepared for the future.