COURSE NOTES

32

BUSINESS VISUALIZATION APPLICATIONS

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Business Visualization Applications
Tuesday July 28, 1992, 8:45am - 12:15pm

How Graphic Technology Impacts the New Information Based Organizations. Irwin M. Jarett, PhD, CPA, Chairman, Graphic M*I*S, Inc., Chicago, IL.

It is beyond the scope or purpose of this short course to discuss the fact that all organizations are information based. But, in truth, there is no need for such a discussion because it is an accepted fact in business today. There are a plethora of business publications dedicated to how such an organization should process it's data.

What may not be clear is the paradigm shift currently underway. Until recently, everyone assumed that the normal presentation of financial, accounting and operating data was numerical, presented in a tabular format. Graphs and word descriptions were added as a supplement to the tabular data, and usually after the tabular data had been analyzed. But that is changing.

> By the year 2000, information will be presented first in a visual form such as a graph or holographic representation of the data. When the visual representation is no longer useful, the tabular data will be presented.

Because visual presentations have such an immediate effect on the viewer, great care must be taken to assure an accurate interpretation of the image. This text shows the financial and accounting personnel charged with displaying operational results how a proven presentation format assures a consistent visual interpretation. Operating personnel who are not trained to read tabular data must consistently "see" the message imbedded in the data. They must be able to carry the ability to see information from one organization to another, if for no other reason than to assure consistent comparisons of similar organizations.

What potential does the addition of computers offer to business graphics? Only a completely different way of running the business. For the first time in the history of computing, we have the potential of consistently displaying all of the factors that create the context within which a business operates so the business people can see the interactions.

What if the systems analyst tried to develop a system that would lower the accident rate on freeway driving. The would certainly worry about how the average human is able to take into consideration all of the various factors that surround driving from home to work. Factors such as: the weather; the highway conditions; the drivers in

front, back and both sides; the on/off ramps; the signage; the instrumentation; and the ever changing physical environment as the community changes from residential to commercial. They would want to consider the several thousand variables considered on each automobile trip to and from work.

And, what if the analyst developed a car that would consider all of the variables, weigh them in relation to each other, and then print a report out of the middle of the steering wheel in tabular form. The highway would most likely look like a Max Stinnett auto chase scene where all the cars end up one on top of the other in the town square. We simply cannot read and react as quickly to data in tabular or written form as we can to data the enters through the visual system.

But, we must also give credit to the laws that permit some form of consistency, ie. all cars go in the same direction in designated lanes; all the signage (graphics) has standard meanings; even the red, yellow and green lights remain in the same position relative to each other. In fact, the highways are designed so that consistency is the byword and the visual response system can count on what they see. We still have accidents because people will ignore the signs and even the most alert drivers who count on some form of consistent response cannot react quick enough to prevent the accident.

Computer based business graphics offers the potential of consistent presentation of data so the viewer can respond to what they see with a sense of confidence. Even the smallest variables about which we have an absolute understanding, but which occur only frequently and thus are considered trivial, can be seen and understood in the complete context of the business environment.

In short, computer business graphics offers the potential to use data visualization as the primary information transfer modality. Thus the paradigm shift from tabular, printed data to visual, interactive data.

This course describes three approaches to the visualization of financial and accounting data. The types of visual applications that are currently available for the business manager will be provided. The three major presenters will offer a 30 minute panel to answer questions and debate the issues.

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Speaker Biographies

Course Organizer:
Irwin M. Jarett, PhD, CPA
Chairman
Graphic M*I*S, Inc.
720 S. Dearborn, Suite 1205
Chicago, IL 60605
Irwin M. Jarett is co-founder and Chairman of Graphic M*I*S, Inc., one of the firms pioneering in the presentation of financial graphics. Dr. Jarett's has created a financial graphic alphabet that describes the business implications of business operations. The financial graphic alphabet provides the foundation for the financial graphic standards proposed by the Illinois Society of CPAs. He is the author of Financial Reporting Using Computer Graphics, (John Wiley & Son's, 1983 & 1987) and is currently writing a reference manual on the same subject for publication in late 1992. Dr. Jarett is the first and current Chairman of the Illinois Society of CPA's Computer Show.

Other Speakers:

Steven M. Cohen
Masters Student
Electronic Visualization Lab
University of Illinois, Chicago
Chicago, IL
Mr. Cohen is a Masters Student in computer visualization at the University of Illinois, Chicago. He is an advanced "C" and UNIX programmer. Mr. Cohen's studies include advanced visualization techniques in business applications. He has worked for over a year with Dr. Jarett in researching the parallel coordinate geometry required to develop "N"View. His masters thesis is tentatively defined to include the research he performed working on this project.

Steven Feiner, PhD
Associate Professor
Columbia University, New York, NY
Steven Feiner is an Associate Professor of Computer Science at Columbia University. He has a Ph.D. in Computer Science from Brown University. Prof. Feiner's research

interests include image synthesis, applications of artificial intelligence to computer graphics, user interfaces, animation, hypermedia, virtual worlds, and visualization. He is coauthor of Computer Graphics: Principles and Practice (Addison-Wesley, 1990) and is on the editorial boards of Electronic Publishing and ACM Transactions on Information Systems. In 1991 he received on Office of Navel Research Young Investigator Award.

Carl Machover
President
Machover Associates Corporation, White Plains, NY
Carl Machover is a respected industry consultant. He is President of Machover Associates Corporation, consultants who provide a broad range of management, engineering, marketing and financial services to computer graphics users, suppliers, and investors. He is Past-President of the National Computer Graphics Association (NCGA) and the Society for Information Display (SID). He is on the editorial boards of a number of industry publications, including Computer Graphics and Applications, Computers and Graphics, and The Visual Computer. Mr. Machover is Consulting Editor of the McGraw-Hill series, Management and Technology of Computer Graphics, the S. Klein Newsletter and is the Project Director for Frost & Sullivan Computer Graphics Reports.

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<u>Schedule of Speakers</u>

1.   **Introduction - A Leisurely Drive to Work in Chicago** - the need to use visualization as the medium for transferring complex and fast changing business information. A brief glimpse into the future. Irwin M. Jarett, PhD, CPA. 20 minutes. . . . . 1 - 1+

2.   **3D Virtual Worlds for Visualizing Business Data.** The proliferation of modern workstation technology has made windows, icons and mice a familiar part of our work environment. But what lies ahead? This presentation will describe how "virtual worlds" that rely on true 3D input and output devices, coupled with high-performance graphics can make it possible to gain a better understanding of complex data. Professor Feiner will discuss work (joint with Cliff Beshers) on the n-Vision visualization system, which presents users with a 3D virtual world in which they can manipulate multivariate functions. n-Vision features a visualization approach that uses nested heterogenous coordinate systems to map multiple variables onto each of three spatial dimensions. Steven Feiner, PhD. 50 minutes. . . . . 2 - 1+

3.   **Building a Complete Business Context Using Parallel Coordinates With Imbedded 3D Financial Graphics and Business Objects.** There is simply too much data for business management to read and understand the multi-variate data that describes their complete corporate and competitive environment. This presentation describes how the new geometry of parallel coordinates combined with a Financial Graphic Alphabet© can help management visualize complex business data relationships in a data emersion system. Using the "N"View© and Fingraph II© software system, a complex business case will be described utilizing a case study with a typical set of business variables and data points. Irwin M. Jarett, PhD, CPA, and Steven M. Cohen, BS. 50 minutes. . . . . 3 - 3+

4.   **A View of the Future.** There are so many technical breakthroughs in data base manipulation and computer graphics that it is difficult to keep track of any patterns that may be emerging. Moving data and graphics among various applications will be the critical application concerns in the '90s. Carl Machover will show how currently available multimedia visualization

techniques can be used to solve a variety of business data presentation problems. Carl Machover. 50 minutes. .... 4 - 4+

5.   **Where Do We Go From Here?** A panel discussion with questions and answers from the floor. Steve Feiner, Irwin M. Jarett, Carl Machover. 30 minutes.

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