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ARE BUSINESS MANAGERS AND NON-TECHNICAL CONSULTANTS READY FOR LOW-COST DISCRETE-EVENT SIMULATION? A SURVEY OF USERS

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ABSTRACT

Until recently, discrete-event simulation tools were expensive, difficult to use, and limited in use to specialists within large corporations. However, in the last few years, several low-cost (under $2000), discrete-event simulation products have been introduced. These products include ProcessModel from ProModel, Process 98 from Scitor and Optima from Micrografx, Inc. Targeted for use by a broader range of simulation user than ever before, these tools take advantage of advances in computer hardware, software standards, graphical design and ease-of-use. Have these new tools simplified simulation enough to make simulation a valuable tool for business managers and non-technical consultants? Who is buying and using low-cost simulation software and how successful are they with these products? This paper explores these questions and others.

1 INTRODUCTION

Earlier this year, Micrografx interviewed Optima customers for feedback to enhance Micrografx's future product development and marketing efforts. While existing customer response and sales growth were positive, there was, until then, little quantitative data about our customer base. Optima is a process modeling and discrete-event simulation tool that runs on Windows-based PC's. Our company wanted to know who was buying and using Optima, what degree of success they were having, and how we could grow the market for the product.

The study results showed that a diverse set of users had purchased the product and found the tool valuable. We also discovered that even though Optima was purchased for its simulation functions, customers gained significant value by using the process documentation and modeling capabilities of the tool. Many users had not yet used simulation but were planning to later.

This paper will first look at demographic, background and experience attributes that define the typical user profile. Second, it will examine how process simulation is used within organizations and how well management accepts its use. Finally, it will analyze the results of the data to determine what product characteristics benefit and add value to the user.

2 METHODOLOGY

The survey was performed in two stages during the summer of 1998. Initially, a series of qualitative interviews was conducted in order to identify issues and criteria for quantification. After this was accomplished, Probe Research was then commissioned to conduct a series of telephone interviews from a random sample of registered Optima users. A total of 141 interviews were completed. During interviews, Micrografx was identified as the sponsor of the study. The sample size is large enough to give a margin of error of ± 7.6 at the 95% confidence level. It is assumed that a sampling of registered users is indicative of the entire user base. Most of the analysis is based on the subset of respondents who are currently doing process simulation.

3 WHO IS USING LOW-COST SIMULATION?

Before analyzing the usage and success of simulation users, we first created a customer profile by reviewing sales records, user registrations, and interview results. The profile indicated that a majority of owners described themselves as "managers" or "consultants". The consultants usually defined themselves as "process practitioners" rather than "simulation specialists."

A demographic profile is described in Table 1. The typical Optima user is male, between 35 and 24 years old, and has less than 5 years experience in Business Process Simulation (BPS).

Although most users interviewed intend to use Optima for simulation, only 30% consider themselves to be BPS users. However, approximately 2/3 of users not involved with BPS plan to use simulation in the future. Low-cost simulation products are typically good at process mapping

and modeling, making it easy for users to get started. This design may unintentionally contribute to modest simulation use. Users find value in documenting their processes and are in little rush to use the simulation capabilities. When asked why simulation is not used, 37% of respondents replied there was no current need. Only 5% of respondents said simulation was too difficult to use.

Table 1: Demographics of Optima Users

Age of Respondent	All	BPS	Non-BPS
Under 25	2.2%	2.4%	2.1%
25-34	23.0%	21.4%	23.7%
35-44	38.1%	31.0%	41.2%
45-54	28.8%	40.5%	23.7%
55-64	7.2%	4.8%	8.2%
65 & Over	0.7%	0.0%	1.0%
Gender	All	BPS	Non-BPS
Male	82.3%	90.5%	78.8%
Female	17.7%	9.5%	21.2%

Acceptance and usage of simulation may be promoted several ways. A majority of BPS users (66%) try to keep current with trends in BPS usage. Figure 1 shows that the Internet is the predominant medium for doing so with almost one-quarter of BPS users surfing the Internet to keep current with trends in the industry. Written media (Books, Periodicals, Journals, etc.) is also an important source of information but the Internet may be the best medium for capturing the attention of simulation users. In particular, company web sites can be used to attract new customers and maintain visibility to existing customers.

The Internet is a valuable resource for the continuing education for BPS users, but it is not their initial method of exposure. As seen in Figure 2, most respondents learned BPS from colleagues or in academia. Since word-of-mouth builds demand for simulation products, it is important to provide the user a good experience with their simulation tools. Given the number of respondents who learned BPS in academia, vendors should also consider building their reputation and customer loyalty by penetrating the classroom where simulation is taught. Because some users learned BPS before the Internet existed, this data is biased against it.

When designing BPS tools that encourage and increase BPS utilization, tool developers must keep the users' wide range of experience in mind. Almost half of BPS users have only 2 years of prior involvement with simulation (Figure 3). However, over a quarter of BPS users have 3 to 5 years experience and another 20% have more than 5 years involvement. Although novices are the primary targets of low-cost simulation, experienced users also exist and while simulation products in this market must mainly cater to the novice they also need to provide power features for the experienced user. Developing linkages to higher-end simulation tools can provide additional flexibility to power users.

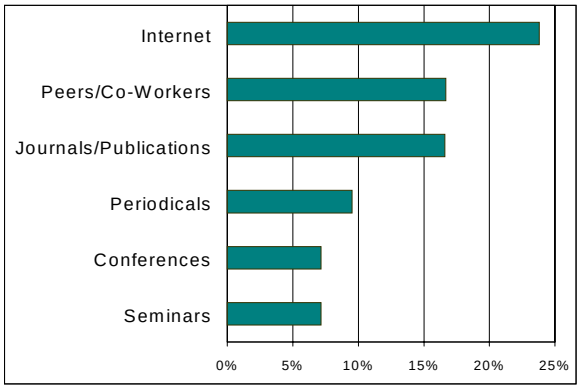

Figure 1: How Users Keep Current with BPS

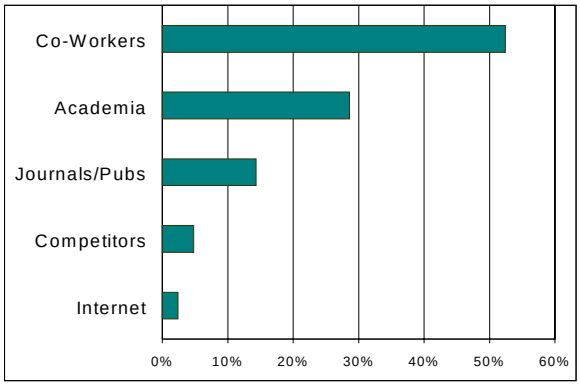

Figure 2: How BPS Users Leaned BPS

As important as the user experience level, is the knowledge base of the user's management. Sadly, most upper management is unaware of the advantages BPS tools deliver. We discovered that only 15% of BPS users rated their management as "Very Knowledgeable" about the use of business simulation and only 12% of BPS users rated their management as "Very Aware" of the value of BPS in the corporate environment.

Unfortunately for users, this same management frequently decides when to use BPS. We found that 53% of users felt they needed to justify the use of BPS to their management. Of those BPS users needing project approval, 84% had to get the approval of a Director or higher level manager. This is true despite the product costing less than

$1000 per unit. When marketing their products, low-cost simulation vendors should investigate methods to increase the benefit-awareness of simulation across all levels of the organization.

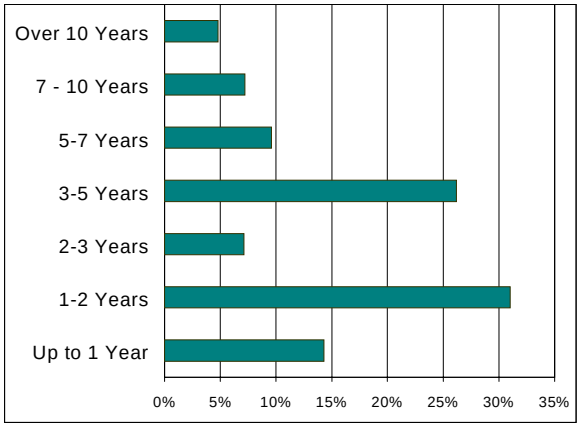

Figure 3: Involvement with BPS prior to Optima

4 HOW IS LOW-PRICE SIMULATION SOFTWARE USED?

We now investigate why our typical user purchased simulation software and how they are using it. Is their purchase decision based on benefits or features? How frequently do they use simulation software? What types of projects are defined and what goals are set for these projects?

The purchase consideration factors most important to users concern issues of functionality and ease-of-use and speak to the benefits of the program for the user. The purchase consideration factors of lesser importance to BPS users tend to be related to specific product features. Figure 4 shows that benefit factors including collective functionality, ease-of-use, graphical interface, cost effectiveness, and support were all primary concerns. Of secondary concern were price and reporting capabilities. Price is mentioned most frequently on an unaided basis, but slips to the second tier when attributes are rated. The data indicates that the most important factors in deciding to buy low-cost simulation primarily involve making the user's job easier.

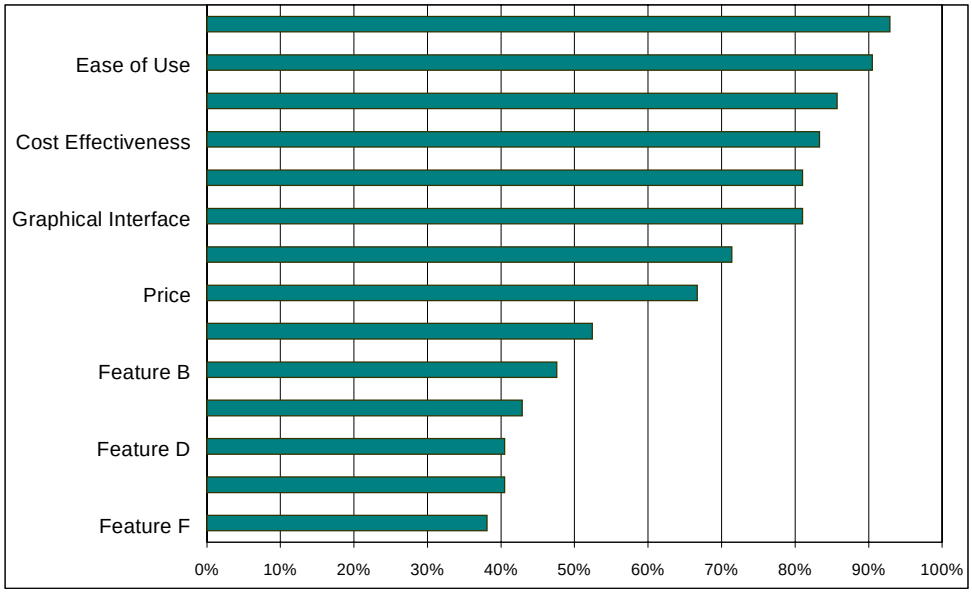

Figure 4: Purchase Consideration Factors

When purchasing a simulation product, users have specific product benefits in mind. How well does the product meet these expectations? When asked what three factors they liked most about Optima, almost half of the respondents surveyed (Table 2) mentioned ease-of-use. Other well-received aspects included simulation capabilities, graphical interface and cost/price. It is comforting to see that users are finding what they are looking for in low-cost simulation. This match encourages greater usage by the buyer and promotes wider deployment of simulation software within organizations.

How frequently is simulation being used? The study shows that, on average, Optima BPS users are not heavy users of the product. This is supported by anecdotal evidence gathered by Micrografx customer support personnel that suggests that Optima is used in simulation projects where bursts of activity are followed by periods of non-use. Figure 5 shows that less than 1 in 5 customers use

the product more than once a week. The importance of ease-of-use, highlighted in the last two charts, is emphasized by this data. A simulation product used infrequently must be easy to use. Otherwise, users will forget product features between engagements with the tool.

Table 2: What BPS Users Like About Optima

Easy to use	48.8%
Simulation Capabilities	38.5%
Graphical Interface	28.2%
Cost/Price	23.1%
Functionality	17.9%

In addition to simulation, users frequently found Optima useful for flowcharting and process modeling. This is especially true for BPS users, since Optima requires a process map and model as a prerequisite for simulation. Interestingly, half of non-BPS users are doing business process modeling. These users are either adding data to their process models for later simulation or modeling processes with no intention to simulate. Further studies are necessary to determine the intent of non-BPS users but the research indicates that Micrografx needs to make it easier for users to migrate from mapping to simulation.

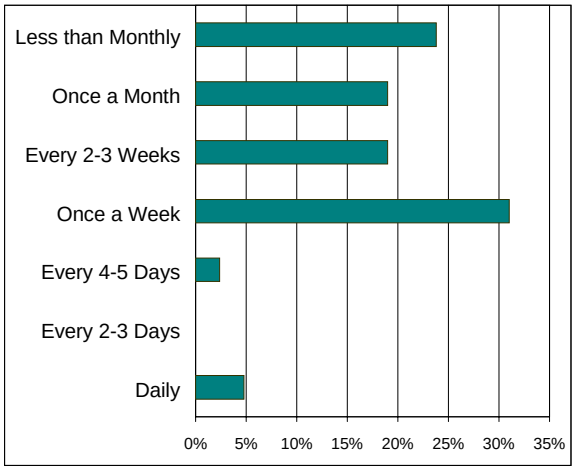

Figure 5: Frequency of Use

What kind of projects are the simulation users involved with? The data in Figure 7 breaks involvement categories into 5 tiers of usage with Business Process Redesign (BPR) ranking as the top category with virtually all respondents involved in it. For this question, users selected answers from a list and could make multiple responses. Although the term "BPR" is starting to loose favor among analysts, partly due to its association with resource layoffs, it is the most recognized reason for using modeling and simulation.

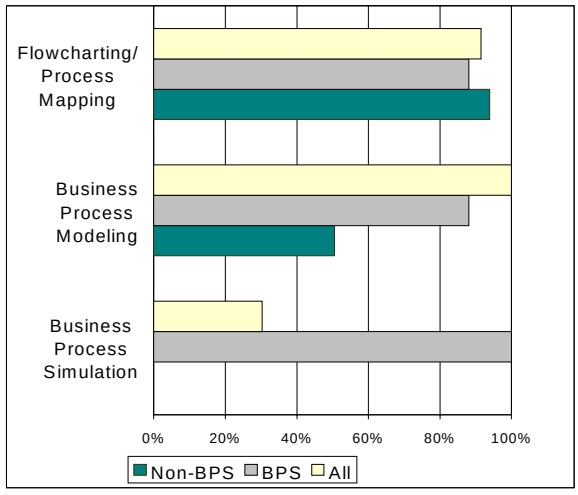

Figure 6: What Optima is Being Used For

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The product usage patterns are further defined by investigating the goals of these process improvement projects. Users were asked what goals they had set for their BPS projects and their responses fell into four major areas: time, money, customer satisfaction and resources (Figure 8).

5 HOW SUCCESSFUL ARE LOW COST SIMULATION USERS?

Almost all BPS users bought the product with some goal or benefit in mind. When asked if they attempted to measure their goals, approximately three-quarters of respondents (76%) replied positively. The goals most frequently measured involved resources, cost and production time. Among the people who set goals, there are no significant differences in importance of these criteria. Since many users are defining measurable goals for the BPS projects, it is important for low-cost simulation tool to add features tying goal measurements with the simulation features. This capability is found in higher-cost tools but rarely seen in less expensive tools.

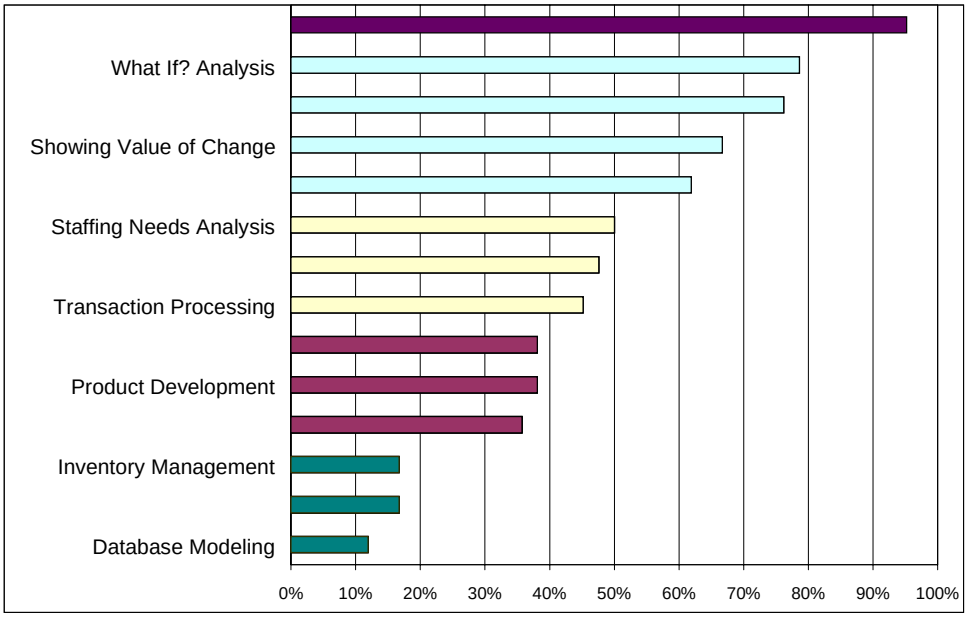

Figure 7: BPS/BPM Project Involvement

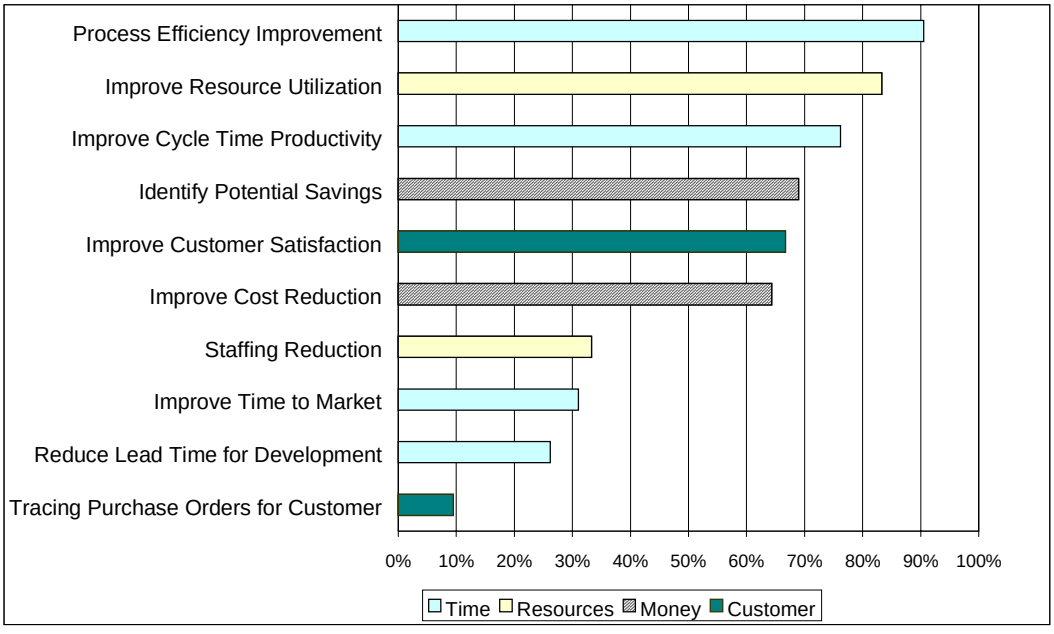

Figure 8: Most Recent BPS Project Goals

Although many users were required to justify their use of BPS to their management, the survey found that almost all respondents felt their project goals were "in synch" with management. Less than 10% of respondents felt management had separate goals.

By setting specific goals, users are able to determine the success of their projects. In virtually all cases, respondents felt that they had accomplished their goals on their most recent project. Given the criteria they defined, only 2% felt they hadn't achieved their goals. In addition, we found that 47% of users were able to calculate the

savings from using BPS. Of those who calculated savings, 63% felt the savings were "significant", 37% felt the savings were "moderate" and no users experienced "insignificant" savings.

Users also feel that this type of product met their expectations on their delivery criteria. Figure 9 shows that delivery scores are commensurate with importance rankings and the product was exceeding expectations on value for price.

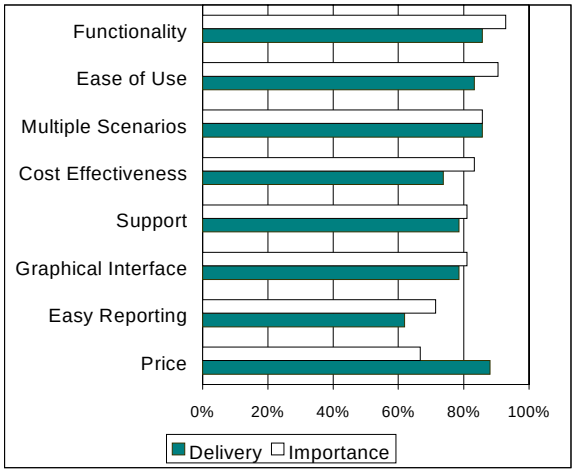

Figure 9: Delivery on Expectations

6 CONCLUSION

The introduction of low-cost simulation tools has diversified the customer base for discrete-event simulation. The merits and benefits of process simulation have also gained exposure among upper level management. These benefits are being measured by using low-cost simulation to optimize resources, reduce costs, and save time. Because goals are being met and money is being saved, customer satisfaction is high. General business managers and their consulting counterparts are proving the value of low-cost process simulation.

AUTHOR BIOGRAPHIES

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