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For Decision-Making, Learn to Build Computer Models

As entrepreneurs know, business opportunities vanish as quickly as they present themselves. When opportunity knocks, entrepreneurs need timely and relevant information that assists them in evaluating the situation and making the correct decision.

Computer model-building is fast becoming one of the preferred methods in making business decisions.

A computer model – a specific set of variables and their interrelationships designed to represent a situation – helps assess data and simplify the decision-making process.

A recent survey conducted by **Centurion Consulting Group** revealed that model-building is growing by more than 30 percent each year. Survey respondents indicated that if they had the resources, they would build two-and-a-half times the number of models they have planned for 1997.

A variety of computer modeling tools are available to assist entrepreneurs in making decisions: Spreadsheets like Excel, Lotus and Quattro-Pro; databases such as Access, Fox-Pro and DBASE; programming languages like C++, SAS and UNIX; and commercial tools such as Pro-Formas for Professionals, @Risk and iThink.

There are four steps in building a computer model:

■ State the problem. The first step in computer modeling is to determine the exact problem and state it as a question.

For example, meet Mr. Smith, the managing partner of a law firm. His firm is growing fast and has more work coming in the door than the attorneys can handle. He needs to hire additional employees, but the problem is that he doesn't know if he should hire attorneys, paralegals, secretaries or support staff.

His question is: "What level of employee should I hire to either maintain or increase the profit margin?"

■ Define and collect the data. Critical to answering the question is to develop a list of the relevant data that will affect the decision.

Mr. Smith defines the data as all of the jobs that the employees perform, the order in which they are performed and the amount of time each job takes to complete. He requests that all



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employees use timesheets for every activity during a one-week period.

As each new piece of data is collected, verify its authenticity and make sure there is enough information to substantiate the results you obtain.

■ Choose the modeling tool. Choose the tool based on your customization needs and the amount of data that you will be processing.

If the data is voluminous, a database may be necessary; however, a spreadsheet may be the tool of choice for small projects. If an off-the-shelf tool suits your needs, then by all means, use it. But if you require a considerable amount of customization, then a commercial tool may not suffice and you will have to create the model yourself or outsource the work.

Mr. Smith selects the flexible Excel spreadsheet, because it's easy to use with good explanatory graphs.

■ Build the model. Now you are ready to start building your computer model, which will answer the question that you posed. There are six components of a model:

1. Input sheet, where the user enters and modifies the data.

Mr. Smith's input data are the various jobs, the level of employees completing the job, the amount of time each job takes and the order that the jobs are completed. Critical to the analysis is not only the level of employees who do the work now, but who should do the work in the future. So Mr. Smith designates levels of employees for

each job (support staff, secretary, paralegal and attorney).

2. Results, or the numerical conclusions based on the inputted data.

From the model, Mr. Smith sees that attorneys are performing paralegal work and paralegals are doing secretarial work. For example, attorneys are doing all of the research work, some of which should be done by paralegals.

3. Charts, or the visual representations of the results.

A graph visually depicts the number and level of employees that Mr. Smith should hire based on his current workload and his forecast of future work.

4. Changing variables and "What if?" scenarios.

Mr. Smith can calculate how an increase in work will affect his hiring decisions.

5. "Sanity check," which determines if input and calculations make sense.

Mr. Smith reviews the tasks and their time allocations for reasonableness.

6. Usability, or the menus, macros and other automation features that make using the model easy and simple.

A major advantage of the computer model for the business person is its ability to answer complicated questions. As more unknowns become facts and as assumptions change to reality, the model evolves and adapts.

A sample computer model is available on EC2's Web site.

Barbara Lewis and Dan Otto are co-founders of Centurion Consulting Group, which helps businesses solve problems through the use of computer models.

Entrepreneur's Notebook is a regular column contributed by EC2, The Annenberg Incubator Project, a center for multimedia and electronic communications at the University of Southern California. Contact Dan Rabinovitch at (213) 743-2344 with feedback and topic suggestions. Point your Web Browser to <http://www.ec2.edu/EC2/sba> to get past issues.