Ear Minicase (Decision Analysis)

THE SCENARIO

It is 5 years from now, and you work for PeachyKeen Software as Assistant Vice President for Long Range Planning. PeachyKeen's business is based on the following sequence of events:

1. An independent developer writes an innovative new software package.

2. The developer approaches PeachyKeen to distribute the software.

3. PeachyKeen tests the new software for bugginess, user interface, usefulness, features, and other areas of concern. This testing costs about $50,000 for *every* potential product tested. They test ten to twenty possibilities in a typical year, and about 2 to 5 of them pass. For PeachyKeen, this testing is just a routine cost of doing business.

4. If it passes PeachyKeen's testing, PeachyKeen and the developer negotiate.

5. If they strike a deal, then PeachyKeen specifies final "polish" (including documentation), and arranges for distribution disks, manuals, packaging, and distribution.

As you can see from this, PeachyKeen is not truly a software house, but is a software publisher.

Your boss, Kay Sirrah, the V.P. of Long Range Planning, has just met with Ivan Werkin, who has developed a new speech processing package named **Ear**. With a cheap telephone handset or headset (not provided), **Ear** will perform most functions of a keyboard and mouse. **Ear** has passed all of PeachyKeen's tests with few glitches. Kay is excited about the prospects for **Ear**, and wants you to help her decide whether the company should publish **Ear**.

Kay and Ivan have worked out a tentative deal. If PeachyKeen publishes **Ear**, it will pay Ivan $200,000 plus 5% of gross sales. While a product like **Ear** will carry a $295 retail list price, PeachyKeen would actually sell it into its distribution channels at $50 per copy for large orders, with the buyer paying all freight costs. PeachyKeen would calculate Ivan's 5% based on the $50/unit actual revenue, *not* list price. Kay's best estimate is that, after Ivan does a final cleanup of his software and manuals, it will cost PeachyKeen about $150,000 to edit the manuals, set type, create master installation disks, design packaging, advertise, and generally prepare the product for the manufacturing stage of publishing. If they cancel the deal now, of course, they avoid these costs.

PeachyKeen's manufacturing process is set up in such a way that there is always a manually produced test run of 100 copies first. After the test run, the process is set up for a run of any number of copies. All later batches of the software must be made in that number. Thus, if the first real run is a batch of 2500 copies, all later runs are 2500 copy runs. It costs $25,000 to set up a run (even the test run). For **Ear**, it appears that the incremental manufacturing cost would be very close to $10 per copy manufactured.

Although it is a great oversimplification, Kay is willing to make the decision based on the possibility that **Ear** will be either a *Dog*, a *Standard*, or a *Killer*. A *Dog* usually loses money. A company usually hopes that most of its new products will prove to be *Standard*s. A *Killer* application, if handled right, is cause for great celebration.

In this case, she defines a *Dog* as selling only 10,000 copies in the first year. A *Standard* would sell 50,000 copies. If it is a *Killer* application, **Ear** will sell 250,000 copies in the first year on the market. It is PeachyKeen Software's policy that they **will** meet demand. If they plan, for example, on a product being a *Standard* and it turns out to be a *Killer*, they **wil**l produce as many more batches as may be required to meet demand, even if the extra setup costs are painful.

The copies made in the test run are not wasted. PeachyKeen sends them to a variety of publications as review copies. In their experience, the reviews have a great deal to do with the sales volume a software publisher can expect to encounter in the first year of sales. Because things change so fast in the computer and software industries, PeachyKeen never counts on a product having a life of greater than a year; if a product sells for several more years, that is "gravy".

Since the possible outcomes appear to be a *Dog*, *Standard*, or *Killer* application, Kay thinks it only makes sense to consider batch sizes that correspond. Thus, the only alternatives they arebeing considereding at this time are:

- Don't sign with Ivan.

- Sign with Ivan, do the test run, check out the reviews, and then make a decision to either
    > 1. Drop the product at that point,
    > 2. Make **Ear** in 1, 5, or 25 batches of 10,000 copies (depending on how demand turns out),
    > 3. Make **Ear** in one or five batches of 50,000 copies, or
    > 4. Make **Ear** in one batch of 250,000 copies.

Kay, after consideration, has assessed the probabilities that **Ear** might get rave reviews, good reviews, or poor review based on whether it is a a *Dog*, a *Standard*, or a *Killer* application. She has also provided for you the probabilities of the product turning out to be a *Dog*, a *Standard*, or a *Killer* application based on her own educated opinion prior to seeing the reviews.

In considering the **Ear** decision, keep in mind that making 10,000, 50,000, or 250,000 copies per batch is a decision to which PeachyKeen must commit **before** they know whether the product will turn out to be a *Dog*, a *Standard*, or a *Killer* application (but **after** reading the reviews). Not only that, but the reviews *do not* determine the demand levels. They only improve your state of information about what demand level might materialize. Thus, no matter what kind of review the techie mags give, any production decision is worth evaluating and any demand level still has some chance of occurring.

THE PROBABILITIES

Suppose that you and Kay agree on the basis of information currently available that the risk that this particular application will be a Dog is 15%, the probability of a Standard is 60%, and the hope for a Killer is 25%. Past history shows that

a. of 40 similar products that later turned out to be Dogs, 2 had earlier received Rave reviews, 8 had earlier received Good reviews, and the other 30 had earlier received Poor reviews

b. of 100 similar products that later turned out to be Standards, 30 had earlier received Rave reviews, 40 had earlier received Good reviews, and the other 30 had earlier received Poor reviews

c. of 20 similar products that later turned out to be Standards, 17 had earlier received Rave reviews, 2 had earlier received Good reviews, and the other 1 had earlier received Poor reviews

YOUR JOB

1. Develop a spreadsheet with columns for Dog, Standard, and Killer for calculating the probabilities of each type of application before and after the reviews are received, and the attractiveness of each of the four alternative actions mentioned above. Each number from the problem statement should occur once and only once in a clearly labeled and appropriately placed cell; refer to this cell in formulas, don't embed the number in the formulas themselves. Be sure to label every part of your spreadsheet in such a way that Kay can understand what you are showing her. Any of the estimates given in the problem statement could change, so make sure you can quickly and accurately respond..

This is a multistage problem. First Kay must decide whether to take Ivan's deal or not. If she takes it, then she's got to spend the money to reach the point of doing the test run and getting the reviews from

Computer Nut, *Nerd Werld*, and all their competitors. As soon as she has seen the reviews, she must decide to call it off or to set up for one of the three batch sizes and produce the first full-scale production batch. Your Payoff Table should deal with her 4 available choices at this stage, and her 3 possible outcomes. Your job will be much easier if you construct at least a picture decision tree before you do anything at all on the computer.

Your spreadsheet should at least help answer these questions:

1. Should PeachyKeen sign a contract with Ivan Werkin on his terms? Keep in mind that if you try to keep Ivan from earning a reasonable return for his efforts, he just might take **EAR** to MaggotSoft or Confuser Associates!

2. If the reviews are Poor, should we abandon the project? Produce in batches of 10,000? 50,000? 250,000? What about if the reviews are Good? Rave?

3. In each of those cases, what's the best course of action and its Expected Monetary Value?

4. What is the Expected Monetary value for the project as a whole?

5. What is the effect if something changes?

Since Expected Monetary Value does not necessarily address all of the issues, you should not base your advice entirely on strict EMV reasoning, though the first step is to see what EMV has to say and provide cogent reasons for your own viewpoint.

Give Kay a brief memorandum stating your recommendations; 1 page, single spaced, with everything else as an attachment.