

# Using a Computer In Negotiations

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Computer programs are useful to licensees; licensees by providing options, quick calculations.

This paper discusses what we believe is a radical new approach suitable for many license negotiations. This is opened up by the possibility of using computer software to "model" many of the commercial aspects of a potential deal. A model is not merely a financial spreadsheet, but a more general tool that allows us to enter data that can be agreed to, or at least discussed, by both sides and that will calculate a commercial end result.

The implications are threefold:

1. Much of the financial analysis associated with a negotiation is simplified.
2. The approach facilitates what we believe is a growing trend toward the use of profit analysis, rather than standard royalty rates, in the assessment of a license.
3. The method can ease the negotiation process by letting the participants see most clearly the tradeoffs they can make, and how potential profits are likely to be shared.

## HERE IT STARTED

Every license negotiation may be looked at as an exercise in cost-benefit analysis for the licensee and the licensor. The truth of this was brought home to one of the writers, some years ago, when working as part of a group trying to promote the licensed transfer of technology into Ireland. What incentives could the state offer to industrial companies, to promote the acquisition of new technology? If it was decided to assist such costs what actual expenditures should be subsidized and how did one assess the benefits?

There were many examples of schemes to assess investment in capital equipment, but these were few, if any, on how to evaluate a license. The conventional wisdom seemed to support suggesting certain standard royalty rates depending on the industry, 2% to 3% for high volume products, 10% to 15% for capital equipment, and so on. The only guideline that seemed to directly address commercial criteria was "the 25% rule." However, there seemed no easy way to adapt this rule to an industrial incentive program aimed at promoting licensing.

In the end, a scheme was developed by means of which, if a licensee met certain basic criteria (e.g. imported a novel and worthwhile technology into the state), the state would help meet the cost of the above payments and royalty payments for two years. This plan has had some success and works best when a company has identified a good market opportunity but needs help to buy in the technology to exploit it.

All that was in 1984 and the writer, like time, moved on. Later, an interest in personal computing and the beckoning green of "expert systems" led to a new attack on the old problem. Because the computer allows us to rapidly enter figures, perform calculations, and then experiment with different figures the problem became one of designing displays that would mirror the costs and benefits, in each case, in a license negotiation. The 25% rule was taken as the way to link the commercial balance between licensee and licensor.

## ◆ Subject of Paper ◆

A computer program to do this was written and was the subject of a paper to IES (first referred to

October 1986). The response was encouraging and led to both of us collaborating to refine the program so that it could be used as a simple general tool to evaluate and even help in the negotiation of license agreements.

Because we believe there is wide scope to use computer models in license negotiations, we think it is worthwhile to share some of the ideas and conclusions that have brought us to our present position, and explain somewhat of what our particular software does. We found the computer model allows us to combine basic elements of a license in a way that leads to a better understanding of the costs and benefits for licensee and licensor. This does not take away from the skill of the negotiator. It allows him or her to take a wider, more commercial, view of the total project of which the licensed technology is just one part.

The program was developed and tested on an IBM-compatible PC. The user can set up data for different licensing deals, whether oral or anticipated. Calculations on the data reflect the costs and benefits of the license to the parties. The data can be quickly entered and changed and the benefits immediately recalculated to reflect different circumstances in the license negotiation. One output is a graphic representation that shows the relative position of the two parties on a "Negotiation Map."

We believe that such a model greatly simplifies for two reasons:

1. The licensor's own money is the one whose money is at risk. Therefore he or she has to be given

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DOWN PAYMENT = 20  
DISCOUNT RATE IS 10%

YEAR	INVESTMENT CAPITAL (C <sub>0</sub> -)	ESTIMATED SALES	ESTIMATED PROFIT (C <sub>1</sub> -)	% RETURN	n or	FIXED AMOUNT
0	30				20	
1	0	100	0	4.00	7	
2	0	100	50	4.00	10	
3	0	100	60	4.00	10	
4	0	40	50	4.00	10	
5	0	100	60	4.00	10	
6	0	0	200	0.00	0	

TOTAL INVESTMENT = 30.0  
INVESTMENT TO LICENSEE = 60.0  
INVESTMENT TO LICENSEE AS % OF  
LICENSEE'S ROI = 20.0%  
PAYBACK = 3.0 Years

#### OUTPUTS

TOTAL NET PROFIT = 2994  
WHICH INCLUDES DOWN PAYMENT OF 200  
TOTAL NET PROFIT = 20.9%  
RESIDUAL VALUE = 200  
I.R.R. = 36.5%  
Profit INDEX = 1.1

Figure 1

the fullest information to make the final decision. They should not be persuaded that some "black box" can give a simple answer to a complex question that calls for a number of subjective judgments. A good model should therefore preserve the "flesh" of the negotiation process.

1. A model that is very complicated may have hidden weaknesses that make it overly sensitive to small variations. The assumptions should therefore be clear and indeed open to question, because every case is different.

The program requires eight basic inputs and provides 14 outputs.

#### INPUTS

The user has to supply the following inputs in the order shown:

- (1) Down Payment including whether the down payment is an advance on the recurring royalty.
- (2) The Discount Rate, representing the cost of borrowing capital.
- (3) Capital Investment.
- (4) Annual Sales projections.
- (5) Annual Profit projections, before the payment of royalties. It has been said that this figure should really be called the "Operating Surplus." We find it easier to call it net profit before royalties.

(6) Royalty Rate including (7) minimum royalty where applicable.

(8) Residual value or the disposal value of the business at the end of the period considered.

Some experts emphasize the importance of Sales and Profit projections to the point they tell you not to work out the Return On Investment (ROI) until the deal is nearly complete. This ignores the ease with which possible outcomes can be calculated using a computer. However, with a computer model there is a danger of giving too much weight to the ROI figure. This is because it can be displayed to two places of decimals, and the user may forget it is only a "ghost" figure—computed by the estimates. This is a trap in all forms of investment analysis.

To avoid elaborate cash flow forecasts only two sets of cash flow inputs are used. Capital Investment and Profit. The first is synonymous with negative cash flow, the second with positive cash flow. As mentioned, the program avoids complicated cash flow tables. Anyone familiar with spreadsheets will realize that these offer endless possibilities to work out the cash flow for a project. What we do is take the output from our Income Statement and use it as input for the program.

#### HOW IT WORKS

To provide new users with an introduction to the program, it is provided with a resident model called "SAMPLE." It will convey a better idea of what the software does if we

look at how it deals with this sample model.

When printed the input and output report for the Sample model looks like Figure 1. This is the key report for a particular set of inputs.

The Discount rate is 10%. This means that all cash flows are discounted at 10% to a Net Present Value (NPV). The table in this case shows inputs for a five-year project.

Investment Capital is, as explained, taken as synonymous with negative cash flow and all "Profit" or Operating Surplus is treated as positive cash flow. For example, losses occurring in any year are entered as a capital item. We have taken the step of providing a full set of definitions within the program itself to explain each data entry. The "breakout value" of 200, in this case, was entered just as if it was profit in the sixth year.

#### OUTPUTS

The Total Net Profit is the NPV of the Profit cash flow. Likewise, the Total Investment (which in this case is 30.0) is the NPV of the Capital Investment. When we get to "Payment to the Licensee," the program is starting to be more useful. This figure (64.9) is made up of the NPV of a 10% rate over the greatest, the annual Royalty Payments or the fixed amount, i.e. Minimum Royalties. It also includes the Down Payment, if any.

Before we discuss the Licensor's Share in detail, let us dispose of some other outputs. The Payback View is of course the answer to the simple question, "how long before we get our money back."

The IRR, or Internal Rate of Return is a more exotic creature. This is the true professional's indicator. The model takes all the licensee's year-by-year cash flows (i.e. Profit - Capital Investment - Royalty) and finds out what discount rate will bring the value to zero. So the licensee, in Sample, would just break even if he was borrowing at 17% or he probably will be happy with this outcome (provided of course his estimates are realistic).

What is the "Profit Index"? This is really the point where, by making the calculations more complex, you arrive back at something quite simple. Divide the IRR (20.8) by the Discount Rate (11) and you get 1.8, the Profit Index. What you have actually done is to divide the Internal Rate of Return (IRR) by the External Rate of Return (the Discount Rate). So the Index is really telling the Licensee how the return on this project compares with a safe investment outside the business. This is good information. It may seem complex, but it encapsulates all the assumptions in the model.

The Licensor's Share is the amount paid to the licensee expressed as a percentage of the Total Net Profit. It includes the Down Payment. A licensee may object to this, arguing that the down payment represents the cost of transferring the technology. If these costs are high he may be justified. The model can deal with either case. If a licensee wants to treat the Down Payment as a separate item he can leave it out, run the model without it, and try to persuade the licensee to treat the cost of transferring the technology as a separate matter.

#### COMBINING MODELS

What you can also do with the model is go back and ask questions like, "What happens if I reduce the royalty from 4% to 3% and increase the down payment to 40?" Alternatively, we can explore the effect of

moving to a higher royalty but making the down payment an advance on the running royalty.

We have designed the display so that it allows us to compare up to four sets of calculations. This is shown in Figure 2. Each column displays a different "version" of Sample, each representing changes in the inputs. Sample 1 is the same as the output in Figure 1. Versions 2, 3 and 4 could have been saved if necessary.

MODEL or	CALCULATION TABLE			
	Sample 1	Sample 2	Sample 3	Sample 4
DISCOUNT RATE (%)	11.0	10.0	11.0	11.0
TOTAL INVESTMENT	92.3	92.5	89.5	92.5
TOTAL NET PROFIT	268.8	299.5	299.2	269.3
DOWN PAYMENT TO LICENSOR	44.5	44.1	71.6	44.5
(DOWN PAYMENT PAID) /	1.23(6)	1.23(6)	1.48(5)	1.23(6)
LICENSEE'S ROI (%)	89.5	288.7	274.8	200.6
LICENSOR'S SHARE (%)	19.5	25.5	27.6	24.9
INT. RATE RETURN (%)	22.8	30.7	32.6	36.3
PAYBACK YEARS =	3.5	3.4	3.6	3.3
Profit INDEX	2.0	3.4	3.2	3.3

Figure 2

The different versions were derived while testing the following changes on the input data:

Sample 2 was the outcome with a Down Payment of 40 and a Royalty rate of 3%.

Sample 3 was the result of making the down Payment (at 20) an advance on the running Royalty and increasing the Royalty rate to 3%.

Sample 4 shows what happens, in the original case, if you assume that at the end of the period the project has a Residual Value of 8 (instead of 20).

#### THE NEGOTIATION MAP

To see what the model thinks of the negotiating position, as between the licensee and/or of this licensee, we can also move back and forward to the Negotiation Map (Figure 3). This places a special symbol, at the appropriate spot, on the Profit Index and the Licensor's Share change.

The Negotiation Map is, we believe, a novel format graphic output that presents a "fairness" zone based on the 20% rule. The MAP differs from the 20% rule by indicating a higher share for the Licensor as the profitability of the project

increases. The graph displays the Profit Index, on the vertical axis against the Licensor's Share, on the horizontal axis. It always shows the current position of the negotiation for the model in use. As the Licensor's share increases the special symbol moves to the right. As the Profit Index increases the cursor moves upward. This instant feedback, on the result of a negotiation, is one of the most valuable things about the model.

#### NEGOTIATION MAP



The Negotiation Map (left) for the present model (at 17%) on the line indicates the model Sample presented in Figure 2.

Figure 3

#### PRACTICAL EXAMPLES

We have used the model in several practical cases with very good results.

In one case a licensee wanted to be getting a very poor deal when paying a substantial down payment for exclusive rights to specialized

transport equipment. What was not immediately evident was the likely residual value of the business after a 5- to 7-year period. The model kept saying this was a poor investment until realistic values were entered for this variable.

In another case, a licensee was going into a negotiation asking for a conventional 10% royalty for a process involving manufacture of wood panels. The model suggested that, because the licensee would require to make very little capital investment, the project would be very profitable and could justify a higher royalty than originally thought.

In another example, the licensee had asked for a very large down-payment, and this did not appear to be justified on the basis of sales projections. However, it became clear that, while the licensee offered was for the whole world the company had only projected sales for Britain and the U.K. Following further market research, to take account of additional sales and sublicensing, in Continental Europe, revised projections were entered in the model and showed the investment to be well worthwhile.

In another case involved a large software charge, which the licensee was trying to levy on each product produced. Negotiations began to break down because neither side could agree on any rational criteria for judging the fairness of the payment for the software element. The problem was brought to one of the authors who used the program to set up a model in which the soft-

ware charge was treated as a royalty. Using the negotiating map, it was shown that the licensee was getting more than two thirds of the net profit. The licensee then accepted that this was unreasonable, in view of the fact that the licensee was taking the major risk. Negotiations were then successfully completed.

In a number of cases, the availability of the computer model has greatly speeded the negotiation process. Once the rationale on which it is based is clearly explained, to both sides, the negotiators find it considerably narrowed and it is very hard to argue against a Negotiating Map that shows the outcome clearly biased against one side or the other. In the experience of the authors the biggest problem in license negotiations is often the unreal expectations of one or both parties. These expectations are frequently based on "poking numbers out of the air." Once it is demonstrated that there are rational methods for license negotiations based on a fair division of profit, as between licensee and licensor, the whole process is simplified.

#### FUTURE DEVELOPMENTS

Licensee practitioners have found that it is usually easier to agree on royalties that are related to sales and come out of cash flow than it is to agree on down payments. Down payments tend to be seen as a high risk element because money is paid in advance. Using our program we can add the down-

payment to the royalties and calculate the net present value of the total payments of the licensee. Thus, a relationship between-down payments and royalties can be established. It is then relatively easy to trade-off a reduction of down payment against an increase in royalties-or vice-versa. It is also relatively easy to show the effect of a change in down payment on the net profit, which is being divided between the parties. We have found that by relating the business of the licensee to the business of the licensor, many problems previously encountered in negotiations can be overcome.

Profit analysis and cost/benefit analysis are, we believe the most effective way to arrive at a fair licensing agreement. With accurate computer modeling, there is also no reason why the licensee or the licensor cannot sit with their advisors, interact with the program and try out different options for payment. Who knows, the time might come when it will be common practice for the licensee and licensor to sit together in front of the computer and argue only about their assumptions and the shared costs and benefits. That, hopefully, would relieve many of the frustrations to record price and to verbally put their cards on the table.

Written: The program described in this article is called *SPICE 2*. Anyone who would like more information about it may contact Kevin Conroy at Computer Technology Management, 28 Wilson Road, Inver Merion, Co. Dublin, Ireland.