

A note about contracts, II : the story continues

by Bernard Beauzamy
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I recently got some news from Donetsk and from Poitiers : both groups made some preliminary mathematical modeling, showed it to the client, and now try to obtain a contract. I hope they will succeed, but I strongly doubt it, since this is not the way things should be handled. In fact, they have fewer chances now than when they started. Let us analyze that in detail.

Mathematicians think that they should first show some mathematics, in order to prove their abilities. But at the same time, they do not want to show too much, since they fear that someone might steal their ideas.

Both statements are wrong, totally wrong. When you hire an architect in order to build a house, you do not ask him to build a reduced scale first, in order to prove his abilities. You look at his records, and you choose him from proven competences. We are mathematicians, we do not have to prove our competence, building small houses first.

Next, if you show a mathematical result to a company, there are very few chances that the company will steal it : they have other things to do. If they find the contents appropriate (and this is the question, as we will see later), they will preferably hire the guy who wrote the paper, rather than take his ideas. For instance, from my book "méthodes probabilistes..." I got several contracts from companies interested in such topics. People asked me "aren't you afraid that someone buys the book, takes your ideas, and does it all by himself ?". Of course not, exactly the same as you cannot become a dentist just because you bought a book about teeth !

So this fear about being stolen is irrelevant. Let us now turn to the true obstacles.

They concern the reaction of the client, when he sees the preliminary work. He might think :

- "I understand nothing to what they did". In this case, he will not continue the discussion.
- "these guys worked in a special case. But we are not always in this special case, so what they did is very specific, and will not apply in general."
- "these people will need a lot of data, and I do not have these data. So their work cannot be applied to my situation."

We (at SCM) met these situations quite often. They are totally normal and usual.

Since, in general, the problem is not under precise form, the first task is to see what forms may be given. So a first contract (for a few days, a few weeks, at most three months) should be as follows : to understand what are the constraints and the objective, what data are available, and so on. This is a work by itself, and should be the contents of a contract.

General rule

A proposal for a contract -no matter to whom it is addressed, public or private - should always be written in non-mathematical terms. It should not contain a single equation, a single formula, a single graph. It should be written in the language of the user : we will reduce your cost, we will make better use of your resources, and so on.

When you hire an architect, you expect him to help you build the house, make the plans, and so on. If he enters technicalities that you do not understand, you become suspicious about him : maybe this guy did not understand what I wanted. How could you be sure, since his answer is not in terms of final needs ?

Quite often, when you build a house, you have to make a deposit before any work has started. This is not the case for mathematical work : we are paid only at the end, sometimes at intermediate steps (but even in this case only when the corresponding work has been done). So we do not need to prove to the client that we are mathematically competent, because he assumes no risk : if we do nothing, he will not pay us at the end. But conversely, because very few mathematicians do this correctly (as the present examples show) we certainly have to convince the client that we can bring a solution which is useful to him. He fears indeed (and he usually has reasons for that !) an academic solution, very nice for publication, but with little connections with his own problems.

Most mathematicians will say : "we do not know how to formulate the client's problems. Our task is to solve some problem, to minimize some function : how this problem, this function, are written is the client's responsibility."

No, this is not true at all. Our primary task is to formulate the problem. And how could you bring a proper solution, a solution that may be useful, if you are already unable to formulate the problem ?