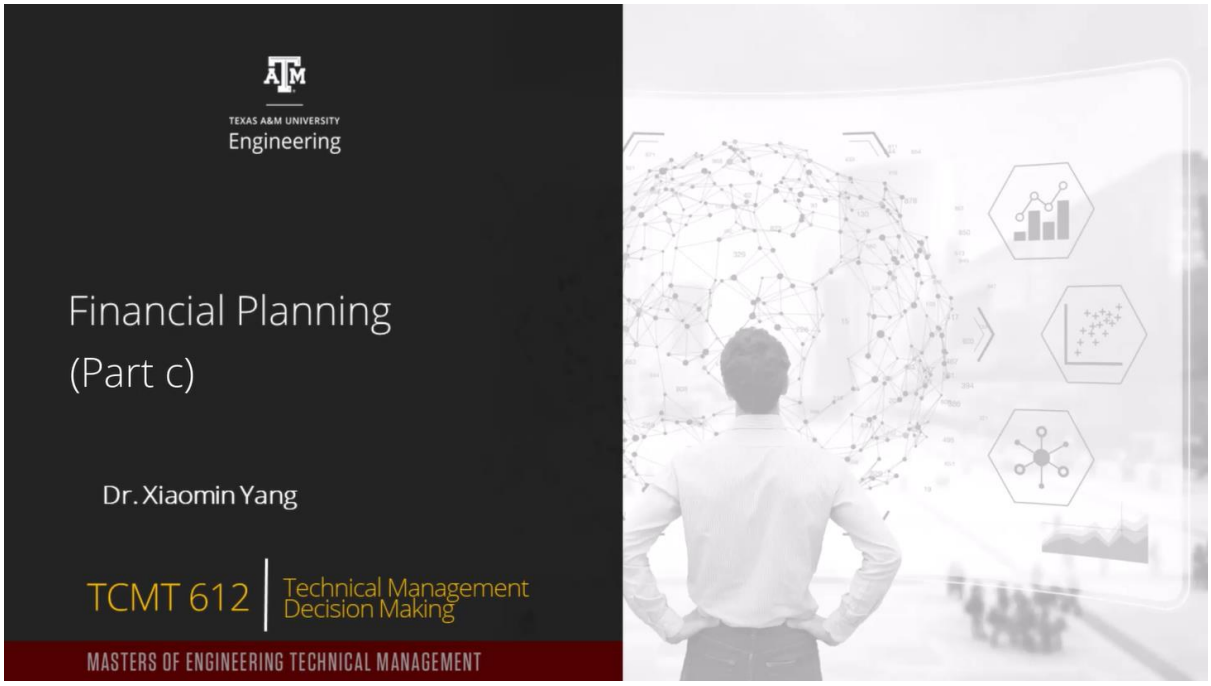
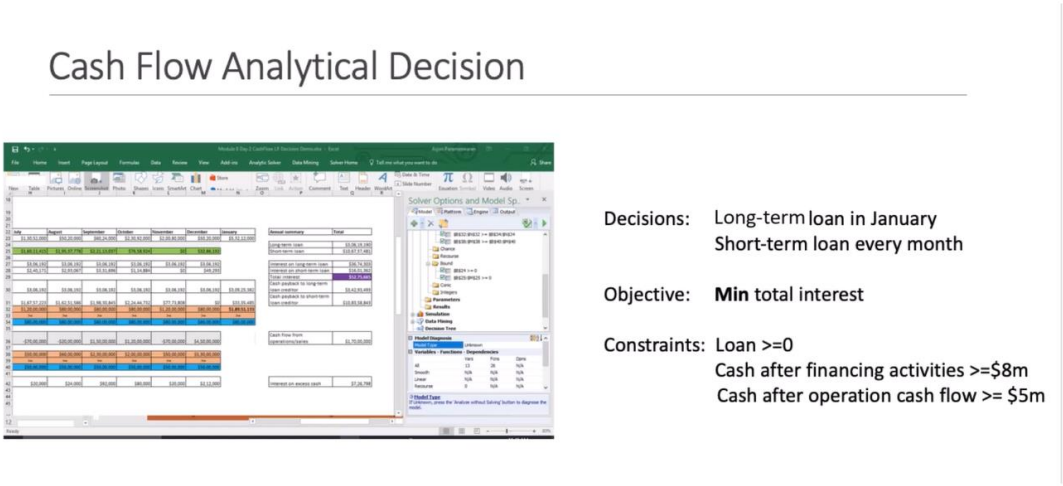
M7L5c. Financial Planning

Slide #1



Slide #2



After completing the business model, the next step is to set up the optimization parameters of the analytic solver add in tool.

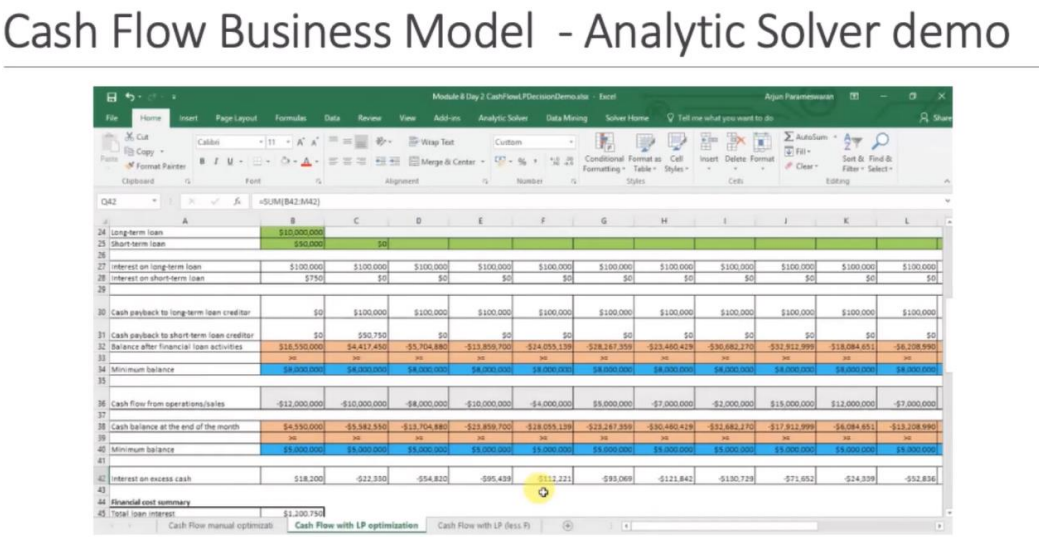
The decisions are a long-term loan in January and short-term loan every month.

You want to determine the amount of annual and monthly loans that your company needs to take on to support operations and meet the cash reserve constraints.

The objective of decision is to minimize the financing cost, which includes the interest of long and short-term loans.

The setup of the optimization model is shown in the screenshot of the model.

Slide #3



The video clip demonstrates the setup of the analytic solver optimization model in Microsoft Excel.

Now that we have everything on our Excel sheet, let us set up the model in the solver.

Let us go to Optimization.

First of all, we will set our objective function. I'll select this. Go to Objective.

Here we need to minimize the total interest.

I go to minimize and say normal. Our objective is added.

Now we move to the variables.

Variables that we need to find out are basically the long-term loan and the multiple short-term loans.

I'll add this as decision variables.

Normal. Long-term loan is added. I'll add these cells as well.

Decisions normal. So, we have our variables in place. Objective in place.

Let's take a look at the constraint.

Here, as mentioned earlier, the balance after financial loan activities should be greater than or equal to the minimum balance as dictated by the management.

I'll add a constraint, normal greater than or equal to.

I'll select this range of cells and say add because I need to add more constraints.

Again, the second constraint is for the cache balance.

That should be greater than or equal to the minimum amount 5 million dollars as dictated by the management.

So I say add because there is one more constraint that we need to look into.

We need to ensure that the loan amount does not go negative.

Again, as we are solving for a minimum value, the solver may run into negative values.

A negative loan amount is not practical. Let us ensure that this remains positive or zero.

Same thing for the short-term loans.

We make sure that these remain either positive or zero.

This is done. The model is set up. We will say solve. I will skip guidance.

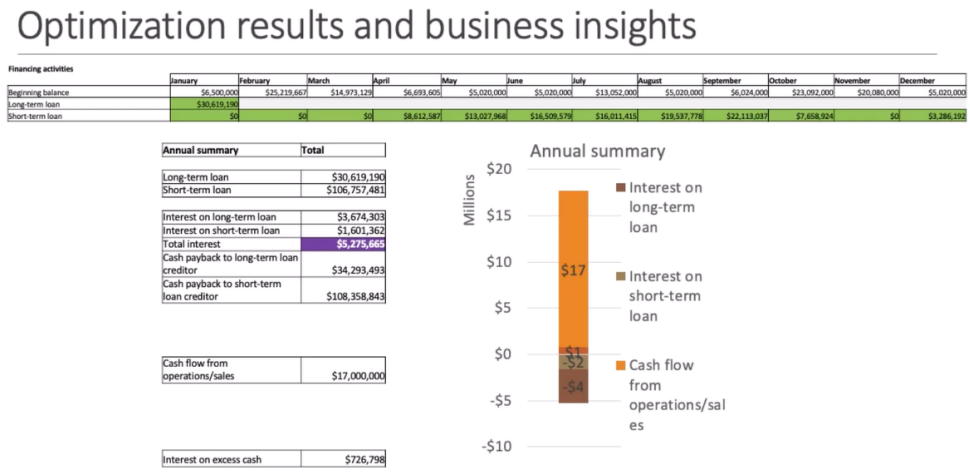
We have a solution here, and this is the minimum amount of interest that the company will pay if it borrows loans according to this particular range of sales.

This is the best possible deal that the company can have.

Here is the graph that tells you how much the company borrows as a short-term and long-term, and what are the cash flow.

And this particular graph tells you the interest and the cash flow, and you have a comparative idea of them all.

Slide #4



The outcomes of the business optimization are shown in these tables and the chart.

The company will take out a 30 million annual loan in January.

The loan is enough to support operations in the first three months of the year.

The company also needs to take out different amounts of monthly loans every month for the rest of the year, except in November.

These long and short-term financing activities will cost the company totally 5.3 million dollars of interest payment.

The interest on the long-term loan is about 3.7 million dollars, which accounts for 70% of the financing cost.

The net annual cash from operations is 17 million dollars.

Also, the company's excess cash generates about $700,000 interest income.

Slide #5

The optimization analytics not only help you make the financing decisions, but also provides business insights that your business teams can immediately act upon and therefore creating value.

As we discussed at the beginning of this lecture, when your organizations see the value of the insights that you derive from the analysis, it will be possible to convince the management to increase the use of the analytical decision-making process.

For instance, this chart shows the monthly operations cash flow, long-term loan, short-term loans, and the cash balance.

Your company has to take on significant long-term debt at the beginning of the year to balance the negative operations cash flow in the first five months of the year.

Actually, the company's unhealthy cash flow creates significant financial pressure, which leads to high financing expense.

It appears that the company collects most of sales revenue by the end of the year.

After paying the principal of last year's annual loan, the company has to take out a new long-term loan in January to finance its operations in the first half of the new year.

The company can reduce the financing cost by aggressively collecting account receivables and managing account payables to generate positive cash flows in the first half of the year.

Based on the insight, you can expect your accounting department and operations department to take actions to improve operations cash flow to lower the financing cost and improve the overall profitability of productions.