

References

- Agarwal, Ritu, Tanniru, Mohan and Zhang, Yimin. "Knowledge Base Model Validation Support for End-user Computing Environments". Decision Support Systems. Volume 15, 1995, pp. 1 - 18.
- Blank, Leland T., and Tarquin, Antony J. Engineering Economy. 3rd edition, Singapore: McGraw-Hill, 1989.
- Breadley, Richard A. and Myers, Stewart C. Principle of Corporate Finance. 5th edition, New York: McGraw-Hill, 1996.
- Brigham, Eugene F. and Gapenski, Louis C. Financial Management. 7th edition, Fort-worth: The Dryden Press, 1994.
- Choetkietikul, P. Sheet Extrusion Technology and Foundation of Thermoforming Process. Project Assignment. Missouri: University of Missouri-Rolla, 1996.
- Chantaro, C. and Thongprasert, S. Project Feasibility Study. 3rd edition, Bangkok: Chulalongkorn University, 1991 (In Thai)
- Foreign Investment Administration, China Economic and Trade Consultant Corp. Ministry of Foreign Trade and Economic Cooperation. Investment in China. Beijing: China International Book, 1979.
- Glasse, James. Packaging in China. Surrey: Pira International, 1994.
- Glenn, Davis C. Introduction to Packaging Machinery. Arlington VA: Packaging Machinery Manufacturers Institution, 1996.
- Hang, Ju. Guide to Investment in Shanghai. Shanghai Foreign Investment Commission. 1994.
- Hilton, Ronald W. Managerial Accounting. 2nd edition, New York: McGraw-Hill, 1994.

Rolid ink corp. Ink manufacturer information. USA: Rolid ink, 1996.

Jenkins, Wilmer A. and Harrington, James P. Packaging Foods with Plastics.
Lancaster: Technomic Publishing, 1991.

Kotler, Philip. Marketing Management. New Jersey: Prentice-Hall, Inc., 1997

Kuang, Xu. Shanghai Economic Yearbook. Shanghai Economy Yearbook
Editorial and Publishing Agency, Pocket Edition, 1995.

Leong, Tan. C and Lim, T.S. China Business and Investment Opportunities.
Shanghai: Cassia Communications, 1993.

Leong, Siew. Meng et al. Marketing Insights for the Asia Pacific. Singapore:
Asia Pacific Marketing Federation, 1996.

David Standard Corp. Machine manufacturer information. Germany: KLOCK-
NER, 1996.

OMV Corp. Machine manufacturer information. Verona: OMV, 1997.

Chittaram Corp. Packaging manufacturer information. Bangkok: Thai Modern
Plastic Public company limited (TM), 1996 - 1997

Pennells, Linda. The China Connection : Shaping a business in Shanghai.
Hong Kong: The Economic Intelligence Unit, 1994.

The Shanghai Municipal Foreign Economic Relations & Trade Commission.
Shanghai Today. Shanghai: 1995.

Turner, Clieve. Module note : Information Systems Strategy. Coventry: Warwick
Manufacturing Group, 1996

Vitoonthien, V. Montreal Protocol Program. Once the ozone layer depletion chemical becomes forbidden, to whom such issue will affect?
Bangkok, Thailand: IFCT, 1997 (Transparency)



สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

Appendix A

Illustration of partial tables in files in feasibility software

Table A1 Files and worksheets

File	Worksheet	File	Worksheet
Capa-anal.xls	Exp-cap	Input.xls	Market
	Inv-plan		Engineering
	Sale-forecast		Management
	Exp-output		Capital
	Product-char		Finance
Mkt-anal.xls	Mkt-char	Output.xls	Sale-rev
	Sale-forecast		Material Req.
			Production cost
			Stock
			Financial statement
			Indicators

Table A2 Partial table in File "Capa-anal.xls"

Expected actual production output (Pcs/month)		Worksheet "Exp Cap"	Year				
Process type	Machine	Product prospect	1	2	3	4	
Down stream process	F30	Drink cup 9 OZ	2,539,389	3,047,267	3,656,720	4,388,064	
		Drink cup 12 OZ	6,771,704	8,128,044	9,751,253	11,701,504	
		0	0	0	0		
		Bowl size 1	1,058,079	1,269,694	1,523,633	1,828,360	
		Bowl size 2	705,386	846,463	1,015,756	1,218,907	
		DP4508	Tray size 2	705,386	846,463	1,015,756	1,218,907
			Tray size 3	705,386	846,463	1,015,756	1,218,907
		Tray size 4	0	0	0	0	
		Tray size 5	0	0	0	0	
		F470	0	0	0	0	0
	Dish size 1		0	0	0	0	
	Dish size 2		0	0	0	0	
	Tray size 1		0	0	0	0	
	F30	0	0	0	0	0	
		0	0	0	0	0	
		Drink cup 16-oz PRNT	2,539,389	3,047,267	3,656,720	4,388,064	
		Drink cup 9 OZ PRNT	1,692,926	2,031,511	2,437,813	2,925,376	
Drink cup 12 OZ PRNT		3,385,852	4,063,022	4,875,627	5,850,752		
0		0	0	0			
0		0	0	0			
Optional down stream process	Vandam 565C	Drink cup 9 OZ PRNT	1,692,926	2,031,511	2,437,813	2,925,376	
Drink cup 12 OZ PRNT		3,385,852	4,063,022	4,875,627	5,850,752		
Drink cup 18 OZ PRNT		2,539,389	3,047,267	3,656,720	4,388,064		

Table A3 Partial table in File "Capa-anal.xls" Worksheet "Inv-plan"

X Share of utilization of machines			Year								
Process type	Machine	Product prospect	1	2	3	4	5	6	7	8	
Down stream process	F30	Drink cup 9 OZ	22.32%	26.79%	32.14%	38.57%	46.29%	55.54%	66.65%	79.98%	
		Drink cup 12 OZ	71.43%	85.72%	102.86%	123.43%	148.12%	177.74%	213.29%	255.95%	
		0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Bowl size 1	20.93%	25.11%	30.13%	36.16%	43.39%	52.07%	62.49%	74.98%	
		Bowl size 2	18.60%	22.32%	26.79%	32.14%	38.57%	46.29%	55.54%	66.65%	
		Total	133.28%	159.94%	191.92%	230.31%	276.37%	331.64%	397.97%	477.56%	
		DP450B	Tray size 2	37.20%	44.64%	53.57%	64.29%	77.14%	92.57%	111.09%	133.30%
	Tray size 3		37.20%	44.64%	53.57%	64.29%	77.14%	92.57%	111.09%	133.30%	
	Tray size 4		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
	Tray size 5		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
	0		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
			Total	74.41%	89.29%	107.14%	128.57%	154.29%	165.15%	222.17%	266.61%
		F470	Dish size 1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Dish size 2		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
	Tray size 1		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
0	0.00%		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		
0	0.00%		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		
		Total	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	

Table A4 Partial table in File "Capa-anal.xls" Worksheet "Inv-plan"

Investment plan		Year / Number of machine							
Process type	Machine	1	2	3	4	5	6	7	8
Down stream process	F30	1	2	2	2	3	3	4	5
	DP450B	1	1	1	1	2	2	2	3
	F470	0	0	0	0	0	0	0	0
	F30	1	1	1	1	2	2	2	3
Optional down stream process	Vandam 565C	1	1	1	2	2	2	3	3
	0	0	0	0	0	0	0	0	0
Up stream process	David STD	0	0	0	0	0	0	0	0
	David STD	0	0	0	0	0	0	0	0

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

Sale forecast

Table A5 Partial table in File "Capa-anal.xls" Worksheet "Sale forecast"

PCS/MONTH

Year

Process type	Machine	Product prospect	1	2	3	4	5	
Down stream process	F30	Drink cup 9 OZ	2,539,389	3,047,267	3,656,720	4,388,064	5,265,677	
		Drink cup 12 OZ	6,771,704	8,126,044	9,751,253	11,701,504	14,041,805	
		0	0	0	0	0		
	DP450B	Bowl size 1	1,058,079	1,269,694	1,523,633	1,828,360	2,194,032	
		Bowl size 2	705,386	846,463	1,015,756	1,218,907	1,462,688	
		Tray size 2	705,386	846,463	1,015,756	1,218,907	1,462,688	
		Tray size 3	705,386	846,463	1,015,756	1,218,907	1,462,688	
		Tray size 4	0	0	0	0	0	
		Tray size 5	0	0	0	0	0	
		0	0	0	0	0		
		F470	Dish size 1	0	0	0	0	0
			Dish size 2	0	0	0	0	0
			Tray size 1	0	0	0	0	0
	F30	0	0	0	0	0	0	
		0	0	0	0	0	0	
		Drink cup 16-oz PRNT	2,539,389	3,047,267	3,656,720	4,388,064	5,265,677	
		Drink cup 9 OZ PRNT	1,692,926	2,031,511	2,437,813	2,925,376	3,510,451	
Drink cup 12 OZ PRNT		3,385,852	4,063,022	4,875,627	5,850,752	7,020,902		
0		0	0	0	0			
0	0	0	0	0				

จุฬาลงกรณ์มหาวิทยาลัย

Table A6 Partial table in File "Capa-anal.xls"

Worksheet "Exp-output"

Expected production output (Pcs/month)

Product prospect	1	2	3	4	5	6	7	8	9	10
Drink cup 9 OZ	2,539,389	3,047,267	3,656,720	4,388,064	5,265,677	6,318,812	7,582,575	9,099,089	10,918,907	11,376,288
Drink cup 12 OZ	6,636,168	8,126,044	9,480,240	9,480,240	9,480,240	9,480,240	9,480,240	9,480,240	9,480,240	9,480,240
0	0	0	0	0	0	0	0	0	0	0
Bowl size 1	1,058,079	1,269,694	1,523,633	1,828,360	2,194,032	2,632,838	3,159,406	3,791,287	4,549,545	5,056,128
Bowl size 2	705,386	846,463	1,015,756	1,218,907	1,462,688	1,755,226	2,106,271	2,527,525	3,033,030	3,639,636
Tray size 2	705,386	846,463	1,015,756	1,218,907	1,462,688	1,755,226	1,896,048	1,896,048	1,896,048	1,896,048
Tray size 3	705,386	846,463	1,015,756	1,218,907	1,462,688	1,755,226	1,896,048	1,896,048	1,896,048	1,896,048
Tray size 4	0	0	0	0	0	0	0	0	0	0
Tray size 5	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
Dish size 1	0	0	0	0	0	0	0	0	0	0
Dish size 2	0	0	0	0	0	0	0	0	0	0
Tray size 1	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
Drink cup 16-oz PRNT	2,539,389	3,047,267	3,656,720	4,388,064	5,265,677	5,972,551	5,972,551	5,972,551	5,972,551	5,972,551
Drink cup 9 OZ PRNT	1,692,926	2,031,511	2,437,813	2,925,376	3,510,451	4,212,541	5,055,050	6,066,060	7,279,272	8,735,126
Drink cup 12 OZ PRNT	3,385,852	4,063,022	4,875,627	5,850,752	7,020,902	8,425,083	9,480,240	9,480,240	9,480,240	9,480,240
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0

Process Characteristic

Table A7 Partial table in File "Capa-anal.xls"

Worksheet "Product Char"

Process	Model	Supplier	Expected Performance		
			Machine utilization (%)	Good yield (%)	Working hrs per month
Down stream process					
Thermoforming	F30	OMV	95%	99%	560
	F470	Gabler	95%	99%	560
	DP450B	Gabler	95%	99%	560
	F30	OMV	95%	99%	560
Optional down stream process	Vandam 565C	Vandam	95%	99%	560
Printing	0				
Up stream process	David STD	David STD	95%	99%	560
Extrusion	David STD	David STD	95%	99%	560
Facility (Chiller, Compressor, etc.)			95%	99%	560

Production program

Phase	Construction	Pre-operation	Operation	Operation	Operation	Operation	Operation	Operation
Year	0	1	2	3	4	5	6	7
Production Program (%)	0%	70%	100%	100%	100%	100%	100%	100%

Table A8 Partial table in File "Capa-anal.xls"

Product Characteristic

Down stream process

Worksheet "Product Char"

Thermoforming

Machine	Product Prospect	Tool arrangement	Cycle rate Cycle / min.
F470	Dish size 1	4	25
	Dish size 2	2	25
	Tray size 1	4	30
F30	Drink cup 16-oz PRNT	15	18
	Drink cup 9 OZ PRNT	18	20
	Drink cup 12 OZ PRNT	15	20

Product Characteristic

Up stream process

Extrusion

Machine	Product Prospect	%AVG. forming area utilization of thermoforming process	Material type	Output Kg/hr	Weight per unit Gms/Pcs
David STD	Dish size 1	50.00%	PP	300	6.3
	Dish size 2	50.00%		300	8.5

Table A9 Partial table in File "Mkt-anal.xls" Worksheet "Mkt-char"

Market characteristic

Based upon market place area 1

Product group	Product portfolio	%product mix	%Market share	Demand EST for product group PCS/YEAR
Drink cup	Drink cup 9 Oz	15.00%	10.00%	240,000,000
	Drink cup 9 Oz Prnt	10.00%	10.00%	
	Drink cup 12 Oz	40.00%	10.00%	
	Drink cup 12 Oz Prnt	20.00%	10.00%	
	Drink cup 16 Oz Prnt	15.00%	10.00%	
Bowl	Bowl I	60.00%	5.00%	50,000,000
	Bowl II	40.00%	5.00%	

Market place comparison

Market place	Market size ratio against Area 1	Market growth
Area 1	1.000	20.00%
Area 2	0.777	20.00%
Area 3	0.623	20.00%
Area 4	4.980	20.00%
Area 5	0.463	20.00%
Area 6	0.360	20.00%
Area 7	0.261	20.00%
Area 8	0.000	0.00%
Area 9	0.000	0.00%
Area 10	0.000	0.00%
Total market size	8.465	20.00%

Total Expected Sale forecast (Pcs / yr.)

Table A10 Partial table in File "Mkt-anal.xls" Worksheet "Sale-forecast"

Product Group	Product prospect	1 (PCS)	2 (PCS)	3 (PCS)	4 (PCS)	5 (PCS)	6 (PCS)	7 (PCS)	8 (PCS)
Drink cup	Drink cup 9 Oz	30,472,667	36,567,200	43,880,640	52,656,768	63,188,121	75,825,746	90,990,895	109,189,074
	Drink cup 9 Oz Prnt	20,315,111	24,378,133	29,253,760	35,104,512	42,125,414	50,550,497	60,660,597	72,792,716
	Drink cup 12 Oz	81,260,444	97,512,533	117,015,040	140,418,048	168,501,657	202,201,988	242,642,386	291,170,863
	Drink cup 12 Oz Prnt	40,630,222	48,756,266	58,507,520	70,209,024	84,250,829	101,100,994	121,321,193	145,585,432
	Drink cup 16 Oz Prnt	30,472,667	36,567,200	43,880,640	52,656,768	63,188,121	75,825,746	90,990,895	109,189,074
Bowl	Bowl I	12,696,944	15,236,333	18,283,600	21,940,320	26,328,384	31,594,061	37,912,873	45,495,447
	Bowl II	8,464,630	10,157,556	12,189,067	14,626,880	17,552,256	21,062,707	25,275,249	30,330,298
	0	-	-	-	-	-	-	-	-
	0	-	-	-	-	-	-	-	-
	0	-	-	-	-	-	-	-	-
Dish	Dish I	8,464,630	10,157,556	12,189,067	14,626,880	17,552,256	21,062,707	25,275,249	30,330,298
	Dish II	8,464,630	10,157,556	12,189,067	14,626,880	17,552,256	21,062,707	25,275,249	30,330,298
	0	-	-	-	-	-	-	-	-
	0	-	-	-	-	-	-	-	-
	0	-	-	-	-	-	-	-	-
Tray	Tray 1	10,157,556	12,189,067	14,626,880	17,552,256	21,062,707	25,275,249	30,330,298	36,398,358
	Tray 2	20,315,111	24,378,133	29,253,760	35,104,512	42,125,414	50,550,497	60,660,597	72,792,716
	Tray 3	5,078,778	6,094,533	7,313,440	8,776,128	10,531,354	12,637,624	15,165,149	18,198,179
	Tray 4	5,078,778	6,094,533	7,313,440	8,776,128	10,531,354	12,637,624	15,165,149	18,198,179
	Tray 5	10,157,556	12,189,067	14,626,880	17,552,256	21,062,707	25,275,249	30,330,298	36,398,358

จุฬาลงกรณ์มหาวิทยาลัย

Table A11 Partial table in File "Input.xls"

Expected production output

(PCS/YEAR)

Worksheet "Market"

Product prospect	Expected selling price (RMB/PCS)	YR1 PCS	YR2 PCS	YR3 PCS	YR4 PCS	YR5 PCS	YR6 PCS
Drink cup 9 oz.	0.090	28,500,000	28,500,000	28,500,000	28,500,000	28,500,000	28,500,000
Drink cup 9 oz. pmt	0.100	17,544,000	17,544,000	17,544,000	17,544,000	17,544,000	17,544,000
Drink cup 12 oz	0.110	75,998,000	75,998,000	75,998,000	75,998,000	75,998,000	75,998,000
Drink cup 12 oz pmt	0.130	42,192,000	42,192,000	42,192,000	42,192,000	42,192,000	42,192,000
Drink cup 16 oz pmt	0.170	35,078,000	35,078,000	35,078,000	35,078,000	35,078,000	35,078,000
Bowl size 1	0.110	11,892,000	11,892,000	11,892,000	11,892,000	11,892,000	11,892,000
Bowl size 2	0.220	8,004,000	8,004,000	8,004,000	8,004,000	8,004,000	8,004,000
Dish size 1	0.170	9,480,000	9,480,000	9,480,000	9,480,000	9,480,000	9,480,000
Dish size 2	0.220	9,480,000	9,480,000	9,480,000	9,480,000	9,480,000	9,480,000
Tray size 1	0.220	11,378,000	11,378,000	11,378,000	11,378,000	11,378,000	11,378,000
Tray size 2	0.200	22,752,000	22,752,000	22,752,000	22,752,000	22,752,000	22,752,000
Tray size 3	0.210	5,888,000	5,888,000	5,888,000	5,888,000	5,888,000	5,888,000
Tray size 4	0.220	5,888,000	5,888,000	5,888,000	5,888,000	5,888,000	5,888,000
Tray size 5	0.230	11,378,000	11,378,000	11,378,000	11,378,000	11,378,000	11,378,000
Total		295,044,000	295,044,000	295,044,000	295,044,000	295,044,000	295,044,000

จุฬาลงกรณ์มหาวิทยาลัย

Production line arrangement

Table A12 Partial table in File "Input.xls"

Worksheet "Engineering"

Process	Model	Product Prospect	Number of line	Supplier	Expected capacity (Kgs/Hr.)	Utility requirement		
						Electricity (KWH)	Air (LT/min)	Water (LT/min)
Extrusion & thermoforming	F-30	No.1-7	2	OMV		678	4,004	33
Thermoforming	F-470	No.8-10,14	1	Gabler		39	6,500	45
Thermoforming	DP-450B	No.11-13	2	Gabler		42	2,500	34
Printing	565C	No. 2,4,5	1	Vandam		6	4,500	-
Extrusion	David STD	Up stream proc	1	David STD		302	340	425
Other						200	1,400	12
Total connected load						1,267	19,244	549
Actual connected load						823.81	19,244	549

จุฬาลงกรณ์มหาวิทยาลัย

Table A13 File "Input.xls" Worksheet "Engineering"

Build of material		Build of material			
Product prospect	Gms/PCS	GPPS (%)	HIPS (%)	PP (%)	MB-PS (%)
Drink cup 9 oz.	2.80			100%	
Drink cup 9 oz. prnt	3.00			97%	
Drink cup 12 oz	4.40			100%	
Drink cup 12 oz prnt	4.60			97%	
Drink cup 16 oz pmt	7.40			97%	
Bowl size 1	5.84			97%	
Bowl size 2	14.30			97%	
Dish size 1	6.30			97%	
Dish size 2	8.50			97%	
Tray size 1	9.82	15%	82%		3%
Tray size 2	8.50	15%	82%		3%
Tray size 3	8.30	15%	82%		3%
Tray size 4	9.00	15%	82%		3%
Tray size 5	9.00	15%	82%		3%

Raw material price

Raw material type	Supplier	Price per unit (RMB/Ton)
GPPS	Shanghai Plastic	5,641
HIPS	Shanghai Plastic	6,581
PP	Oil Chemical Industry	6,838
MB-PS	-	16,453
MB-PP	-	17,094

Human resource planning

Table A14 Partial table in File "Input.xls"
Worksheet "Management"
Manufacturing site

Management

Plant manager	1
Secretary	1

Engineering

Engineering manager	1
Industrial engineer	2
Mechanical engineer	1
Electrical engineer	1
Officer	2

Production

Production manager	1				
Officer	2				
Production line	F-30 (1)	F-30 (2)	DP450B (1)	DP450B (2)	F-470
Technician / shift	2	2	1	1	1
Worker / shift	2	2	1	1	1

Warehouse & Delivery

Warehouse manager	1
Officer	1
Worker	4

Personnel

Personnel manager	1
Officer	1

Head office site

Managing Director	1
General manager	1
Market manager	1
Sale manager	1
Account / finance manager	1
Officer	5

Factory site

Department	Production	Warehouse	Personnel	Engineering	Management
Plant manager					1
Department manager	1	1	1	1	
Officer	2	1	1	2	1
Engineer				4	
Technician	27				
Worker	27				

Total investment cost

Table A15 Partial table in File "Input.xls" Worksheet "Capital"

Item	Unit	Price per Unit	YR0 RMB	YR1 RMB	YR2 RMB
1. Fixed asset					
1.1 Machinery					
F-30	2	8,712,000	17,424,000		
F-470	1	817,164	817,164		
DP-450B	2	1,289,968	2,579,936		
565C	1	2,800,000	2,800,000		
David STD	1	4,673,158	4,673,158		
Crusher	1	265,517	265,517		
Depreciation period (Yr)	10				
Machine import tax 0%			-		
Allowance for commissioning (10%)			2,855,978		
Total			31,415,753	-	-
Item	Depreciation period (Year)		YR0 RMB	YR1 RMB	YR2 RMB
1.2 Tool (Mould)	5		11,000,000		
1.3 Land rental	50		2,214,000		
1.4 Building&land development	20		4,214,000		
1.5 Facility	10		3,607,000		
1.6 Material handling	10		1,214,000		
1.7 Vehicle	5		1,500,000		
1.8 Laboratory	10		329,000		
1.9 Office equipment	5		940,000		
Total			25,018,000	-	-
2. Pre-operating expense	10		880,000		
3. Sale and administration expense					
3.1 Bonus				50,500	55,550
3.2 Transportation (2% of sale revenue)				602,119	660,170
3.4 Entertainment				60,000	60,000
3.5 Communication expense				96,000	96,000
3.6 Consultant fee (Legal & Auditor)				20,000	20,000
3.7 Maintenance cost of vehicle				50,000	50,000
3.8 Salary and wages				606,000	666,600
3.9 Fringe benefit (60% of salary)				484,800	533,280
3.10 Commission (0.3% of sale revenue)				90,318	129,025
3.11 Miscellaneous				102,987	123,531
Total				2,162,723	2,594,156
4. Working capital expenditure					
			Cycle		
	Duration (Months)		Frequency (Cycles/month)		
4.1 Inventory (Raw material)	0.50		2.00		
4.2 Inventory (Finished goods)	0.70		1.43		
4.3 Inventory (Factory accessory)	0.50		2.00		
4.4 Account receivable	1.00		1.00		
4.5 Account payable	1.00		1.00		

Basic terms on loans

Table A16 Partial table in File "Input.xls" Worksheet "Finance"

Short term loan : Interest rate 18%
Period of loan 1 Years

Installment schedule for Long term loan

Long term loan : Interest rate 8%
Period of loan 10 Years

Year	0	1	2
Installment payment RMB	-	-	-

Source of finance

Long term loan 50%
Equity 50%

Basic term on tax

Income tax 16% of Earning before tax

Table A17 Partial table in File "Output.xls" Worksheet "Sale-rev"

Sale revenue (RMB)

Based upon Expected Actual Production Volume

Product prospect	YR1 RMB	YR2 RMB	YR3 RMB	YR4 RMB	YR5 RMB	YR6 RMB	YR7 RMB
Drink cup 9 oz.	1,795,500	2,565,000	2,565,000	2,565,000	2,565,000	2,565,000	2,565,000
Drink cup 9 oz. prnt	1,228,080	1,754,400	1,754,400	1,754,400	1,754,400	1,754,400	1,754,400
Drink cup 12 oz	5,851,692	8,359,560	8,359,560	8,359,560	8,359,560	8,359,560	8,359,560
Drink cup 12 oz prn	3,839,472	5,484,960	5,484,960	5,484,960	5,484,960	5,484,960	5,484,960
Drink cup 16 oz prn	4,174,044	5,962,920	5,962,920	5,962,920	5,962,920	5,962,920	5,962,920
Bowl size 1	915,684	1,308,120	1,308,120	1,308,120	1,308,120	1,308,120	1,308,120
Bowl size 2	1,232,616	1,760,880	1,760,880	1,760,880	1,760,880	1,760,880	1,760,880
Dish size 1	1,128,120	1,611,600	1,611,600	1,611,600	1,611,600	1,611,600	1,611,600
Dish size 2	1,459,920	2,085,600	2,085,600	2,085,600	2,085,600	2,085,600	2,085,600
Tray size 1	1,751,904	2,502,720	2,502,720	2,502,720	2,502,720	2,502,720	2,502,720
Tray size 2	3,185,280	4,550,400	4,550,400	4,550,400	4,550,400	4,550,400	4,550,400
Tray size 3	836,136	1,194,480	1,194,480	1,194,480	1,194,480	1,194,480	1,194,480
Tray size 4	875,952	1,251,360	1,251,360	1,251,360	1,251,360	1,251,360	1,251,360
Tray size 5	1,831,536	2,616,480	2,616,480	2,616,480	2,616,480	2,616,480	2,616,480
0	-	-	-	-	-	-	-
Total sale revenue	30,105,936	43,008,480	43,008,480	43,008,480	43,008,480	43,008,480	43,008,480

Material requirement

Table A18 Partial table in File "Output.xls" Worksheet "Material-req"

1.1 Raw material used	YR1	YR2	YR3	YR4	YR5	YR6	YR7
	RMB	RMB	RMB	RMB	RMB	RMB	RMB
GPPS	299,642	428,059	428,059	428,059	428,059	428,059	428,059
HIPS	1,910,999	2,729,999	2,729,999	2,729,999	2,729,999	2,729,999	2,729,999
PP	5,212,142	7,445,917	7,445,917	7,445,917	7,445,917	7,445,917	7,445,917
MB-PS	174,792	249,703	249,703	249,703	249,703	249,703	249,703
MB-PP	209,559	299,370	299,370	299,370	299,370	299,370	299,370
Total raw material used	7,807,134	11,153,049	11,153,049	11,153,049	11,153,049	11,153,049	11,153,049
1.2 Packing material used	YR1	YR2	YR3	YR4	YR5	YR6	YR7
	RMB	RMB	RMB	RMB	RMB	RMB	RMB
Cup 9 oz.	112,808	161,154	161,154	161,154	161,154	161,154	161,154
Cup 12 oz.	579,121	827,316	827,316	827,316	827,316	827,316	827,316
Cup 16 oz.	171,872	245,532	245,532	245,532	245,532	245,532	245,532
Bowl size 1	23,308	33,298	33,298	33,298	33,298	33,298	33,298
Bowl size 2	98,049	140,070	140,070	140,070	140,070	140,070	140,070
Dish size 1	46,452	66,360	66,360	66,360	66,360	66,360	66,360
Dish size 2	46,452	66,360	66,360	66,360	66,360	66,360	66,360
Tray size 1	30,968	44,240	44,240	44,240	44,240	44,240	44,240
Tray size 2	61,936	88,480	88,480	88,480	88,480	88,480	88,480
Tray size 3	15,484	22,120	22,120	22,120	22,120	22,120	22,120
Tray size 4	17,420	24,885	24,885	24,885	24,885	24,885	24,885
Tray size 5	23,226	33,180	33,180	33,180	33,180	33,180	33,180
Total packing material used	1,227,096	1,752,995	1,752,995	1,752,995	1,752,995	1,752,995	1,752,995

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

Production cost

Table A19 Partial table in File "Output.xls" Worksheet "Production cost"

1. Material requirement (RMB)

1.1 Raw material type	Year						
	1	2	3	4	5	6	7
	RMB	RMB	RMB	RMB	RMB	RMB	RMB
GPPS	1,690,278,282	2,414,683,260	2,414,683,260	2,414,683,260	2,414,683,260	2,414,683,260	2,414,683,260
HIPS	12,576,285,468	17,966,122,098	17,966,122,098	17,966,122,098	17,966,122,098	17,966,122,098	17,966,122,098
PP	35,640,627,892	50,915,182,702	50,915,182,702	50,915,182,702	50,915,182,702	50,915,182,702	50,915,182,702
MB-PS	2,875,849,820	4,108,356,886	4,108,356,886	4,108,356,886	4,108,356,886	4,108,356,886	4,108,356,886
MB-PP	3,582,206,432	5,117,437,760	5,117,437,760	5,117,437,760	5,117,437,760	5,117,437,760	5,117,437,760
Total raw material cost	56,365,247,894	80,521,782,706	80,521,782,706	80,521,782,706	80,521,782,706	80,521,782,706	80,521,782,706
1.2 Packing material type	1	2	3	4	5	6	7
	RMB	RMB	RMB	RMB	RMB	RMB	RMB
Cup 9 oz.	789,655	1,128,078	1,128,078	1,128,078	1,128,078	1,128,078	1,128,078
Cup 12 oz.	4,053,848	5,791,212	5,791,212	5,791,212	5,791,212	5,791,212	5,791,212
Cup 16 oz.	1,203,107	1,718,724	1,718,724	1,718,724	1,718,724	1,718,724	1,718,724
Bowl size 1	163,158	233,083	233,083	233,083	233,083	233,083	233,083
Bowl size 2	686,343	980,490	980,490	980,490	980,490	980,490	980,490
Dish size 1	325,164	464,520	464,520	464,520	464,520	464,520	464,520
Dish size 2	325,164	464,520	464,520	464,520	464,520	464,520	464,520
Tray size 1	216,776	309,680	309,680	309,680	309,680	309,680	309,680
Tray size 2	433,552	619,360	619,360	619,360	619,360	619,360	619,360
Tray size 3	108,388	154,840	154,840	154,840	154,840	154,840	154,840
Tray size 4	121,937	174,195	174,195	174,195	174,195	174,195	174,195
Tray size 5	162,582	232,260	232,260	232,260	232,260	232,260	232,260
Total packing material cost	8,589,674	12,270,962	12,270,962	12,270,962	12,270,962	12,270,962	12,270,962

2. Direct labor

Item	Year						
	1	2	3	4	5	6	7
	RMB	RMB	RMB	RMB	RMB	RMB	RMB
2.1 Technician	324,000	356,400	392,040	431,244	474,368	521,805	573,986
2.2 Worker	275,400	302,940	333,234	366,557	403,213	443,534	487,888
2.3 Fringe benefit (80% of salary)	479,520	527,472	580,219	638,241	702,065	772,272	849,499
Total direct labor cost	1,078,920	1,186,812	1,305,493	1,436,043	1,579,647	1,737,611	1,911,373

5. Depreciation and amortization

Table A20 Partial table in File "Output.xls" Worksheet "Production cost"

Item	1	2	3	4	5	6	7
	RMB	RMB	RMB	RMB	RMB	RMB	RMB
5.1 Building	210,700	210,700	210,700	210,700	210,700	210,700	210,700
5.2 Machinery	3,141,575	3,141,575	3,141,575	3,141,575	3,141,575	3,141,575	3,141,575
5.3 Tools (mould)	2,200,000	2,200,000	2,200,000	2,200,000	2,200,000	2,200,000	2,200,000
5.4 Equipment	670,100	670,100	670,100	670,100	670,100	670,100	670,100
5.5 Vehicle	300,000	300,000	300,000	300,000	300,000	300,000	300,000
5.6 Laboratory	32,900	32,900	32,900	32,900	32,900	32,900	32,900
5.7 Land	44,280	44,280	44,280	44,280	44,280	44,280	44,280
5.8 Pre-operating expense	88,000	88,000	88,000	88,000	88,000	88,000	88,000
Total depreciation and amortization	6,687,555	6,687,555	6,687,555	6,687,555	6,687,555	6,687,555	6,687,555

Total production cost

Item	Year						
	1	2	3	4	5	6	7
	RMB	RMB	RMB	RMB	RMB	RMB	RMB
1. Material cost	56,373,837,568	80,534,053,668	80,534,053,668	80,534,053,668	80,534,053,668	80,534,053,668	80,534,053,668
2. Direct labor cost	1,078,920	1,186,812	1,305,493	1,436,043	1,579,647	1,737,611	1,911,373
3. Indirect labor cost	889,920	978,912	1,076,803	1,184,484	1,302,932	1,433,225	1,576,548
4. Factory overhead	1,245,360	1,245,360	1,245,360	1,245,360	1,245,360	1,245,360	1,245,360
5. Depreciation	6,687,555	6,687,555	6,687,555	6,687,555	6,687,555	6,687,555	6,687,555
Total production cost (RMB)	56,383,739,323	80,544,152,308	80,544,368,880	80,544,607,110	80,544,869,162	80,545,157,420	80,545,474,504

จุฬาลงกรณ์มหาวิทยาลัย

Stock

Table A21 Partial table in File "Output.xls" Worksheet "Stock"

1. Raw material	YR1	YR2	YR3	YR4	YR5	YR6	YR7	YR8	YR9
	RMB	RMB	RMB	RMB	RMB	RMB	RMB	RMB	RMB
GPSS	12,485	17,836	17,836	17,836	17,836	17,836	17,836	17,836	17,836
HIPS	79,625	113,750	113,750	113,750	113,750	113,750	113,750	113,750	113,750
PP	217,173	310,247	310,247	310,247	310,247	310,247	310,247	310,247	310,247
MB-PS	7,283	10,404	10,404	10,404	10,404	10,404	10,404	10,404	10,404
MB-PP	8,732	12,474	12,474	12,474	12,474	12,474	12,474	12,474	12,474
Total raw material stock	325,297	464,710	464,710	464,710	464,710	464,710	464,710	464,710	464,710
2. Packing material	YR1	YR2	YR3	YR4	YR5	YR6	YR7	YR8	YR9
	RMB	RMB	RMB	RMB	RMB	RMB	RMB	RMB	RMB
Cup 9 oz.	4,700	6,715	6,715	6,715	6,715	6,715	6,715	6,715	6,715
Cup 12 oz.	24,130	34,472	34,472	34,472	34,472	34,472	34,472	34,472	34,472
Cup 16 oz.	7,161	10,231	10,231	10,231	10,231	10,231	10,231	10,231	10,231
Bowl size 1	971	1,387	1,387	1,387	1,387	1,387	1,387	1,367	1,387
Bowl size 2	4,085	5,836	5,836	5,836	5,836	5,836	5,836	5,836	5,836
Dish size 1	1,936	2,765	2,765	2,765	2,765	2,765	2,765	2,765	2,765
Dish size 2	1,936	2,765	2,765	2,765	2,765	2,765	2,765	2,765	2,765
Tray size 1	1,290	1,843	1,843	1,843	1,843	1,843	1,843	1,843	1,843
Tray size 2	2,581	3,687	3,687	3,687	3,687	3,687	3,687	3,687	3,687
Tray size 3	645	922	922	922	922	922	922	922	922
Tray size 4	726	1,037	1,037	1,037	1,037	1,037	1,037	1,037	1,037
Tray size 5	968	1,383	1,383	1,383	1,383	1,383	1,383	1,383	1,383
Total packing material stock	51,129	73,041	73,041	73,041	73,041	73,041	73,041	73,041	73,041
3. Finished goods	YR1	YR2	YR3	YR4	YR5	YR6	YR7	YR8	YR9
	RMB	RMB	RMB	RMB	RMB	RMB	RMB	RMB	RMB
Drink cup 9 oz.	104,738	149,625	149,625	149,625	149,625	149,625	149,625	149,625	149,625
Drink cup 9 oz. prmt	71,638	102,340	102,340	102,340	102,340	102,340	102,340	102,340	102,340
Drink cup 12 oz	341,349	487,641	487,641	487,641	487,641	487,641	487,641	487,641	487,641
Drink cup 12 oz prmt	223,969	319,956	319,956	319,956	319,956	319,956	319,956	319,956	319,956
Drink cup 16 oz prmt	243,486	347,837	347,837	347,837	347,837	347,837	347,837	347,837	347,837
Bowl size 1	53,415	76,307	76,307	76,307	76,307	76,307	76,307	76,307	76,307
Bowl size 2	71,903	102,718	102,718	102,718	102,718	102,718	102,718	102,718	102,718
Dish size 1	65,807	94,010	94,010	94,010	94,010	94,010	94,010	94,010	94,010
Dish size 2	85,162	121,660	121,660	121,660	121,660	121,660	121,660	121,660	121,660
Tray size 1	102,194	145,992	145,992	145,992	145,992	145,992	145,992	145,992	145,992
Tray size 2	185,808	265,440	265,440	265,440	265,440	265,440	265,440	265,440	265,440

Income statement

Table A22 Partial table in File "Output.xls" Worksheet "Financial statement"

Item	YR0 RMB	YR1 RMB	YR2 RMB	YR3 RMB	YR4 RMB	YR5 RMB	YR6 RMB	YR7 RMB
1. Total sales	-	30,105,936	43,008,480	43,008,480	43,008,480	43,008,480	43,008,480	43,008,480
Less :								
2. Cost of goods sold	-	17,179,806	22,628,461	23,759,007	23,997,237	24,259,289	24,547,547	24,864,631
Gross profit	-	12,926,130	20,380,019	19,249,473	19,011,243	18,749,191	18,460,933	18,143,849
Less :								
3. Selling & administration expense	-	2,162,723	2,594,156	2,725,976	2,870,979	3,030,481	3,205,934	3,398,931
Earning before interest & tax	-	10,763,406	17,785,863	16,523,497	16,140,265	15,718,710	15,254,999	14,744,918
Less :								
5. Interest expense (Long term loan)	-	2,292,550	2,292,550	2,292,550	2,292,550	1,630,150	1,630,150	1,630,150
6. Interest expense (Bank overdraft)	-	694,298	991,855	991,855	991,855	991,855	991,855	991,855
Earning before tax	-	7,776,558	14,501,458	13,239,092	12,855,860	13,096,705	12,632,995	12,122,913
Less :								
7. Income tax	-	1,244,249	2,320,233	2,118,255	2,056,938	2,095,473	2,021,279	1,939,666
Net profit (Loss)	-	6,532,309	12,181,225	11,120,837	10,798,922	11,001,232	10,611,715	10,183,247
Retained earning :								
Beginning Balance	-	-	6,532,309	18,713,534	29,834,371	40,633,294	51,634,526	62,246,241
Net profit (Loss)	-	6,532,309	12,181,225	11,120,837	10,798,922	11,001,232	10,611,715	10,183,247
Ending balance	-	6,532,309	18,713,534	29,834,371	40,633,294	51,634,526	62,246,241	72,429,488

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

Cash flow statement

Table A23 Partial table in File "Output.xls" Worksheet "Financial statement"

Item	YR0 RMB	YR1 RMB	YR2 RMB	YR3 RMB	YR4 RMB	YR5 RMB	YR6 RMB	YR7 RMB
Cash in :								
1. Equity	28,656,876	-	-	-	-	6,720,000	-	-
2. Long term loan	28,656,876	-	-	-	-	6,720,000	-	-
3. Bank overdraft	-	3,857,212	5,510,304	5,510,304	5,510,304	5,510,304	5,510,304	5,510,304
4. Cash collection	-	27,597,108	41,933,268	43,008,480	43,008,480	43,008,480	43,008,480	43,008,480
Total cash in	57,313,753	31,454,320	47,443,572	48,518,784	48,518,784	61,958,784	48,518,784	48,518,784
Cash out :								
1. Investment cost	57,313,753	-	-	-	-	13,440,000	-	-
2. Material purchase	-	8,626,435	13,107,700	13,443,795	13,443,795	13,443,795	13,443,795	13,443,795
3. Direct labor	-	1,078,920	1,186,812	1,305,493	1,436,043	1,579,647	1,737,611	1,911,373
4. Indirect labor	-	889,920	978,912	1,076,803	1,184,484	1,302,932	1,433,225	1,578,548
5. Factory overhead	-	1,245,360	1,245,360	1,245,360	1,245,360	1,245,360	1,245,360	1,245,360
6. Selling & administration expense	-	2,162,723	2,594,156	2,725,976	2,870,979	3,030,481	3,205,934	3,398,931
7. Long term loan instalment	-	-	-	-	-	15,000,000	-	-
8. Bank overdraft	-	3,857,212	5,510,304	5,510,304	5,510,304	5,510,304	5,510,304	5,510,304
9. Long term loan interest expense	-	2,292,550	2,292,550	2,292,550	2,292,550	1,630,150	1,630,150	1,630,150
10. Bank overdraft interest expense	-	694,298	991,855	991,855	991,855	991,855	991,855	991,855
11. Income tax	-	1,244,249	2,320,233	2,118,255	2,056,938	2,095,473	2,021,279	1,939,666
Total cash out	57,313,753	22,091,669	30,227,882	30,710,391	31,032,306	59,269,996	31,219,513	31,647,981
Net cash In/Out	-	9,362,652	17,215,689	17,808,392	17,486,478	2,688,788	17,299,271	16,870,802
Beginning balance	-	-	9,362,652	26,578,341	44,386,733	61,873,211	64,561,999	81,861,269
Ending balance	-	9,362,652	26,578,341	44,386,733	61,873,211	64,561,999	81,861,269	98,732,072

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

Balance sheet

Table A24 Partial table in File "Output.xls" Worksheet "Financial statement"

Item	Year							
	0 RMB	1 RMB	2 RMB	3 RMB	4 RMB	5 RMB	6 RMB	7 RMB
Current assets :								
1. Cash in hand	-	9,362,652	26,578,341	44,386,733	61,873,211	64,561,999	81,861,269	98,732,072
2. Account receivable	-	2,508,828	3,584,040	3,584,040	3,584,040	3,584,040	3,584,040	3,584,040
3. Inventories	-	2,132,606	3,046,580	3,046,580	3,046,580	3,046,580	3,046,580	3,046,580
Total current assets	-	14,004,085	33,208,961	51,017,353	68,503,831	71,192,618	88,491,889	105,362,691
Fixed assets :								
1. Land	2,214,000	2,169,720	2,125,440	2,081,160	2,036,880	1,992,600	1,948,320	1,904,040
2. Factory & office building	4,214,000	4,003,300	3,792,600	3,581,900	3,371,200	3,160,500	2,949,800	2,739,100
3. Machines	31,415,753	28,274,177	25,132,602	21,991,027	18,849,452	15,707,876	12,566,301	9,424,726
4. Tools	11,000,000	8,800,000	6,600,000	4,400,000	2,200,000	11,000,000	8,800,000	6,600,000
5. Factory equipment	4,821,000	4,338,900	3,856,800	3,374,700	2,892,600	2,410,500	1,928,400	1,446,300
6. Laboratory	329,000	296,100	263,200	230,300	197,400	164,500	131,600	98,700
7. Office equipment	940,000	752,000	564,000	376,000	188,000	940,000	752,000	564,000
8. Vehicle	1,500,000	1,200,000	900,000	600,000	300,000	1,500,000	1,200,000	900,000
9. Pre-operating expenses	880,000	792,000	704,000	616,000	528,000	440,000	352,000	264,000
Total fixed asset	57,313,753	50,626,197	43,938,642	37,251,087	30,563,532	37,315,976	30,628,421	23,940,866
Total asset	57,313,753	64,630,283	77,147,603	88,268,440	99,067,362	108,508,595	119,120,310	129,303,557
Current liabilities :								
Bank overdraft	-	-	-	-	-	-	-	-
Account payable	-	784,221	1,120,316	1,120,316	1,120,316	1,120,316	1,120,316	1,120,316
Total current liabilities	-	784,221	1,120,316	1,120,316	1,120,316	1,120,316	1,120,316	1,120,316
Long term liabilities :								
Long term loan	28,656,876	28,656,876	28,656,876	28,656,876	28,656,876	20,376,876	20,376,876	20,376,876
Total long term liabilities	28,656,876	28,656,876	28,656,876	28,656,876	28,656,876	20,376,876	20,376,876	20,376,876
Equities :								
Retained earnings	-	6,532,309	18,713,534	29,834,371	40,633,294	51,634,526	62,248,241	72,429,488
Common equity	28,656,876	28,656,876	28,656,876	28,656,876	28,656,876	35,376,876	35,376,876	35,376,876
Total equities	28,656,876	35,189,185	47,370,410	58,491,247	69,290,170	87,011,402	97,623,118	107,806,365
Total liabilities & equities	57,313,753	64,630,283	77,147,603	88,268,440	99,067,362	108,508,595	119,120,310	129,303,557

Net present value (RMB)

Table A25 File "Output.xls" Worksheet "Indicators"

Item	Year						
	0 RMB	1 RMB	2 RMB	3 RMB	4 RMB	5 RMB	6 RMB
Total liabilities & equities	57,313,753	-	-	-	-	13,440,000	-
Net cash flow	-	9,362,652	17,215,689	17,808,392	17,486,478	2,688,788	17,299,271
Net discounted value of earning	- 57,313,753	8,511,501	14,227,842	13,379,709	11,943,500	- 6,675,657	9,764,987
Net present value (10 Yrs)	15,455,835						

Sensitivity analysis

Fluctuated variable	Range of fluctuation				
	-20%	-10%	0%	+10%	+20%
1. Sale revenue	- 12,868,966	450,869	15,455,835	27,090,538	40,410,373
2. Long term interest rate	15,700,653	14,735,678	15,455,835	12,805,729	11,840,754
3. Raw material price	24,983,795	19,377,249	15,455,835	8,164,158	2,657,612
4. Currency (RMB against US\$)	1,931,529	7,851,116	15,455,835	19,690,291	25,609,878

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย



Appendix B

Example of application and list of sensitivity files.

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

Table B1 Sensitivity files and their fluctuated variables

File	Fluctuated variable	Scale of fluctuation
Sense1.xls	Sale revenue	-20%
Sense2.xls	Sale revenue	-10%
Sense3.xls	Sale revenue	+10%
Sense4.xls	Sale revenue	+20%
Sense5.xls	Long term interest rate	-20%
Sense6.xls	Long term interest rate	-10%
Sense7.xls	Long term interest rate	+10%
Sense8.xls	Long term interest rate	+20%
Sense9.xls	Raw material price	-20%
Sense10.xls	Raw material price	-10%
Sense11.xls	Raw material price	+10%
Sense12.xls	Raw material price	+20%
Sense13.xls	Currency exchange rate	-20%
Sense14.xls	Currency exchange rate	-10%
Sense15.xls	Currency exchange rate	+10%
Sense16.xls	Currency exchange rate	+20%

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

Example of application

This example therefore involves input, output parameters, their numerical relationships, and processing. Such numerical relationships are readily summarized in Table 5.1, Table 5.2, and Table 5.3

1. File : Output.xls Worksheet : Production cost

1.1 Output parameter : Material requirement

Spreadsheet cell : F8

Numerical relationship : Material price * Raw material used

Processing : Material requirement in year 1 = $1,690,278,282 = 299,642 * 5,641$

1.2 Output parameter : Direct labor-cost

Spreadsheet cell : F41

Numerical relationship : Average salary * Number of employee * Annual adjustment (10% per annum)

Processing : Direct labor cost in year 1 = $324,000 = 1,000 * 27 * 12 * 1.1$
power 0

1.3 Output parameter : Factory overhead (electricity) cost

Spreadsheet cell : F63

Numerical relationship : Utility requirement * Utility cost * Expected performance *
Number of working hours per day * Number of working
days per year.

Processing : Factory overhead cost in year 1 = $316,976 = 823.81 * 80% * 0.067 * 24 * 300$

1.4 Output parameter : Depreciation and amortization cost

Spreadsheet cell : F77

Numerical relationship : Investment on fixed assets / depreciation period

Processing : Depreciation and amortization cost in year 1 = $210,700 = 4,214,000 / 20$

1.5 Output parameter : Total production cost

Spreadsheet cell : F99

Numerical relationship : Material cost + direct labor cost + indirect labor cost +
depreciation cost + factory overhead cost

Processing : Total production cost in year 1 = 56,384,065,808 =
 56,373,837,568 + 1,078,920 + 889,920 + 1,571,845 +
 6,687,555

2. File : Output.xls Worksheet : Sale revenue

2.1 Output parameter : Sale revenue

Spreadsheet cell : C6

Numerical relationship : Expected selling price * Sale projection * Production program

Processing : Sale revenue in year1 = 1,795,500 = 28,500,000 * 0.09 * 70%

3. File : Output.xls Worksheet : Material req.

3.1 Output parameter : Raw material used

Spreadsheet cell : F6

Numerical relationship : BOM * Product weight * Production program * Sale projection

Processing : Raw material used in year 1 = 299,642 = 70% * 5,641 * 76

4. File : Output.xls Worksheet : Stock

4.1 Output parameter : Stock of raw material

Spreadsheet cell : F6

Numerical relationship : Raw material used * Cycle of raw material inventory

Processing : Stock of raw material in year 1 = 12,485 = 299,642 * 0.5 / 12

4.2 Output parameter : Stock of finished goods

Spreadsheet cell : F35

Numerical relationship : Sale revenue * Cycle of finished goods inventory

Processing : Stock of finished goods in year1 = 104,738 = 1,795,500 *
 0.7 / 12

5. File : Output.xls Worksheet : Financial statements

5.1 Output parameter : Output

Spreadsheet cell : F8

Numerical relationship : Sale revenue + Stock of finished goods

Processing : Output in year 1 = 31,862,116 = 30,105,936 + 1,756,180

5.2 Output parameter : Raw material purchase

Spreadsheet cell : F21

Numerical relationship : Raw material used + Stock of raw material

Processing : Raw material purchase in year1 = 8,132,431 = 7,807,134 +
325,297**5.3 Output parameter : Beginning Inventory**

Spreadsheet cell : F33

Numerical relationship : Ending inventory of the previous year

Processing : Ending inventory in year 1 = 0

5.4 Output parameter : Ending Inventory

Spreadsheet cell : F42

Numerical relationship : Stock of finished goods + Stock of material

Processing : Ending inventory in year1 = 2,132,606 = 1,756,180 + 51,129
+ 325,297**5.5 Output parameter : Cost of goods available for sale**

Spreadsheet cell : F40

Numerical relationship : Material purchase + Indirect labor + Direct labor +
Factory overhead + Depreciation and amortizationProcessing : Cost of goods available for sale in year 1 = 19,638,897 = 0 +
9,410,656 + 1,078,920 + 889,920 + 1,571,845 +
6,687,555**5.6 Output parameter : Cost of goods sold**

Spreadsheet cell : F43

Numerical relationship : Cost of goods available for sale - Ending stock

Processing : Cost of goods sold in year 1 = 17,506,291 = 19,638,879 -
2,132,606**5.6 Output parameter : Total sale and administration cost**

Spreadsheet cell : F56

Numerical relationship : Bonus + Transportation + Entertainment +
Communication + Consultant fee + Maintenance cost of
vehicles + Miscellaneous + Salary / wage + Fringe
benefit + CommissionProcessing : Total sale and administration cost in year 1 = 2,274,773 =
50,500 + 602,109 + 60,000 + 96,000 + 20,000 + 50,000
+ 606,000 + 484,800 + 90,318 + 102,987**5.7 Output parameter : Account payable**

Spreadsheet cell : F65

Numerical relationship : Material purchase * Cycle of account payable / 12

Processing : Account payable in year 1 = 784,221 = (8,132,431 + 1,278,225) * 1 / 12

5.8 Output parameter : Cash payment

Spreadsheet cell : F67

Numerical relationship : Account payable in the previous year + Total material purchase - Account payable in the current year

Processing : Cash payment in year 1 = 8,626,435 = 0 + 9,410,636 - 784,221

5.9 Output parameter : Account receivable

Spreadsheet cell : F76

Numerical relationship : Sale revenue * Cycle of account receivable / 12

Processing : Account receivable in year1 = 2,508,828 = 30,105,936 * 1 / 12

5.10 Output parameter : Cash collection

Spreadsheet cell : F78

Numerical relationship : Account receivable in the previous year + Sale revenue - Account receivable in the current year

Processing : Cash collection in year 1 = 27,597,108 = 0 + 30,105,936 - 2,508,828

5.11 Output parameter : Working capital requirement

Spreadsheet cell : F91

Numerical relationship : Stock of material + Stock of finished goods + Account receivable - Account payable

Processing : Working capital requirement in year 1 = 3,857,212 = 1,756,180 + 325,297 + 51,129 + 2,508,808 - 784,221

5.12 Output parameter : Long term loan

Spreadsheet cell : F98

Numerical relationship : % Long term loan * (Total fixed asset + Pre-operating expense)

Processing : Long term loan in year 0 = 28,656,876 = 50% * (31,415,753 + 25,018,000 + 880,000)

5.13 Output parameter : Bank overdraft

Spreadsheet cell : F99

Numerical relationship : Working capital expenditure in the previous year

Processing : Bank overdraft in year 0 = 0

5.14 Output parameter : Equity

Spreadsheet cell : F100

Numerical relationship : % Equity * (Total fixed asset + Pre-operating expense)

Processing : $\text{Equity in year 0} = 28,656,876 = 50\% * (31,415,753 + 25,018,000 + 880,000)$ **5.15 Output parameter : Draw-down of equity**

Spreadsheet cell : F110

Numerical relationship : Equity in the current year

Processing : $\text{Draw-down of equity in year 0} = 28,656,876$ **5.16 Output parameter : Beginning balance of equity in the current year**

Spreadsheet cell : F109

Numerical relationship : Ending balance of equity in the previous year

Processing : $\text{Beginning balance of equity in year 0} = 0$ **5.17 Output parameter : Ending balance of equity in the current year**

Spreadsheet cell : F111

Numerical relationship : $\text{Beginning balance of equity} + \text{Draw-down of equity in the current year}$ Processing : $\text{Ending balance of equity in year 0} = 28,656,876$ **5.18 Output parameter : Beginning balance of long term loan in the current year**

Spreadsheet cell : F118

Numerical relationship : Ending balance of the previous year

Processing : $\text{Beginning balance of long term loan in year 0} = 0$ **5.19 Output parameter : Draw-down of long term loan**

Spreadsheet cell : F119

Numerical relationship : Long term loan

Processing : $\text{Draw-down of long term loan in year 0} = 28,656,876$ **5.20 Output parameter : Long term loan installment**

Spreadsheet cell : F120

Numerical relationship : Installment payment schedule

Processing : $\text{Long term loan installment in year 0} = 0$ **5.21 Output parameter : Ending balance of long term payment**

Spreadsheet cell : F121

Numerical relationship : $\text{Beginning balance of long term loan in the current year} + \text{Draw-down of loan} - \text{Installment payment schedule}$ Processing : $0 + 28,656,876 - 0$

5.22 Output parameter : Beginning balance of short term loan

Spreadsheet cell : F128

Numerical relationship : Ending balance of short term loan in the previous year

Processing : Beginning balance of short term loan in year 0 = 0

5.23 Output parameter : Withdraw, Payment

Spreadsheet cell : F129, F130

Numerical relationship : Bank-overdraft

Processing : Withdraw, payment in year 0 = 0

5.24 Output parameter : Ending balance of short term loan

Spreadsheet cell : F131

Numerical relationship : Beginning balance of short term loan + Withdraw -
Payment

Processing : Ending balance of short term loan in year 0 = 0

5.25 Output parameter : Gross profit

Spreadsheet cell : G142

Numerical relationship : Total sales - Cost of goods sold

Processing : Gross profit in year 1 = 12,599,645 = 30,105,936 -
17,506,291**5.26 Output parameter : Earning before interest & tax**

Spreadsheet cell : G146

Numerical relationship : Gross profit - Selling & administration cost

Processing : Earning before interest & tax in year 1 = 10,436,921 =
12,599,645 - 2,162,723**5.27 Output parameter : Earning before tax**

Spreadsheet cell : G150

Numerical relationship : Earning before interest & tax - Short term loan Interest
rate * Bank-overdraft - Long term loan interest rate *
Ending balance of long term loanProcessing : Earning before tax in year1 = 7,450,073 = 10,436,921 -
18%*3,857,212 - 8%* 28,656,876**5.28 Output parameter : Income tax**

Spreadsheet cell : G152

Numerical relationship : If (Earning before tax > 0, Earning before tax * income
tax rate, 0)Processing : Income tax in year 1 = 1,192,212 = If (7,450,073 > 0,
7,450,073 * 16%, 0)

5.29 Output parameter : Net profit (loss)

Spreadsheet cell : G154

Numerical relationship : Earning before tax - Income tax

Processing : Net profit (loss) in year 1 = 6,258,061 - 7,450,073 -
1,192,212**5.30 Output parameter : Beginning balance of retained earning**

Spreadsheet cell : G157

Numerical relationship : Ending balance of retained earning in the previous year

Processing : Beginning balance of retained earning in year 1 = 0

5.31 Output parameter : Ending balance of retained earning

Spreadsheet cell : G159

Numerical relationship : Beginning balance of retained earning + Net profit
(loss)Processing : Ending balance of retained earning in year 1 = 6,258,061 = 0 +
6,258,061**5.32 Output parameter : Total cash in**

Spreadsheet cell : G172

Numerical relationship : Equity + Long term loan + Bank overdraft + Cash
collectionProcessing : Total cash in (year 1) = 31,454,320 = 0 + 0 + 3,897,212 +
27,597,108**5.33 Output parameter : Total cash out**

Spreadsheet cell : G186

Numerical relationship : Investment cost + Material purchase + Indirect labor +
Direct labor + Factory overhead + Selling &
administration expense + Long term installment + Bank
overdraft + Interest expense (long term loan) + Interest
expense (short term loan) + Income taxProcessing : Total cash out (year 1) = 22,365,916 = 0 + 8,626,435 +
1,078,920 + 889,920 + 1,571,845 + 2,162,723 + 0 +
3,857,212 + 2,292,550 + 694,298 + 1,192,012**5.34 Output parameter : Net cash in/out**

Spreadsheet cell : G188

Numerical relationship : Total cash in - Total cash out

Processing : Net cash in/out in year 1 = 9,088,404 = 31,454,320 -
22,365,916

5.35 Output parameter : Beginning balance of net cash

Spreadsheet cell : G189

Numerical relationship : Ending balance of net cash in the previous year

Processing : Beginning balance of net cash in year 1 = 0

5.36 Output parameter : Ending balance of net cash

Spreadsheet cell : G190

Numerical relationship : Beginning balance of net cash + Net cash in/out

Processing : Ending balance of net cash in year 1 = 9,088,404

5.37 Output parameter : Cash In hand

Spreadsheet cell : G199

Numerical relationship : Ending balance of net cash in the current year

Processing : Cash in hand in year 1 = 9,088,404

5.38 Output parameter : Total current assets

Spreadsheet cell : G202

Numerical relationship : Cash in hand + Account receivable + Inventories

Processing : Total current assets in year 1 = 9,088,404 + 2,508,828 +
2,132,606

5.39 Output parameter : Total fix assets

Spreadsheet cell : G214

Numerical relationship : Land + Factory & office bldg + Machines + Tools +
Factory equipment + Laboratory + Office equipment +
Vehicles + Pre-operating expenses

Processing : Total fix assets in year 1 = 50,626,197 = 2,169,720 +
4,003,300 + 28,274,177 + 8,800,000 + 4,338,900 +
296,100 + 752,000 + 1,200,000 + 792,000

5.40 Output parameter : Total current liabilities

Spreadsheet cell : G220

Numerical relationship : Ending balance of short term payment in the current year
+ Account payable

Processing : Total current liabilities in year 1 = 784,221 = 0 + 784,221

5.41 Output parameter : Total long term liabilities

Spreadsheet cell : G224

Numerical relationship : Ending balance of long term payment in the current year

Processing : Total long term liabilities in year 1 = 28,656,876

5.41 Output parameter : Total equities

Spreadsheet cell : G229

Numerical relationship : Ending balance of retained earning + Ending balance of equities

Processing : Total equities in year 1 = 34,914,938 = 6,256,061 + 28,658,876

6. File : Output.xls Worksheet : Indicator

6.1 Output parameter : Net discount value of earning

Spreadsheet cell : G10

Numerical relationship : $(\text{Net cash} - \text{Total liabilities and equities}) / \text{Power}(1.1, \text{Number of current year})$

Processing : Net discount value of earning in year 1 = 8,262,186 = $(9,088,404 - 0) / \text{Power}(1.1, 1)$

6.2 Output parameter : Net present value

Spreadsheet cell : G12

Numerical relationship : Net discount value of earning in year 0 to year 10

Processing : Net present value of project = 13,770,704 = $(-57,313,753) + 8,262,186 + 14,001,192 + 13,173,663 + 11,756,185 + (-6,845,943) + 9,610,182 + 8,516,657 + 7,522,543 + 6,618,804 + (-1,531,011)$

Biography



Mr. Chaiwat Rangsitsathien was born in Nakornsithammarat Province in 1970. His education background has started at Anubanakornsithammarat Primary School in my hometown. He subsequently went to Songkla province for secondary school and high school from year 1982 to 1989. He went for further study in Bangkok afterwards at College of Engineering Chulalongkorn University. In 1992, he graduated from this university in field of Industrial Engineering. Five years later, he again went for further study for Master degree of Engineering Management (Chulalongkorn University and University of Warwick).

With regard to his working experience, he 's worked for Thai Modern Plastic Ind. Company Limited as a process engineer, and project development engineer respectively. During joining this company, he mostly took responsible for machine commissioning project, production line control, and then project feasibility study.

In year 1998 to current, he has joined General Seating Thailand whose business has been dealing with Automotive interior. In this company, he works as a program engineer who is mainly in charge of developing new automotive seating model in terms of program management, technical arrangement, and other manufacturing implications.

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย