

Industrial Carbon Composites

Feasibility Analysis

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<u>Total Benefits</u>		50,116,283.68
<u>Cost of Purchased Items</u>	155,323.00	
<u>Cost of Implementing System</u>	156,384.48	
%5 Cost of System (Maintenance)	15,585.37	
Total Cost		327,292.85
Net Present Value		
(over 6 years)		50,443,576.53

Estimated growth	15%	ICC Financial Analysis						
Job-Tracking	Total Costs	2008	2009	2010	2011	2012	2013	Total Benefits
revenue from MFG Sheet		29,839.21	29,309.39	28,999.66	28,794.30	30,328.95	27,494.86	174,766.37
cost of purchased items	15,000.00							
cost of implementing system	40,564.00							
Total cost	55,564.00							
Inventory								
revenue from MFG Sheet		39,785.62	39,079.18	38,666.22	38,392.41	40,438.59	36,659.81	233,021.83
cost of purchased items	7,000.00							
cost implementing system	22,680.00							
Total cost	29,680.00							
Outsourcing								
revenue from MFG Sheet		29,839.21	29,309.39	28,999.66	28,794.30	30,328.95	27,494.86	174,766.37
cost of purchased items	15,000.00							
cost implementation	116,747.00							
Total cost	131,747.00							
Electronic Design Exchange								
revenue from CUSTOM-DESIGN Sheet		103,733.94	100,859.09	97,153.52	94,537.30	91,730.48	98,140.47	586,154.80
cost of purchased items	17,000.00							
cost of implementing system	16,531.20							
Total cost	33,531.20							
Web Portal								
increase in business by 5% (conservative) from RESEARCH Sheet		48,278.85	170,048.70	140,006.65	166,681.80	72,263.50	190,968.30	176,051.31
total revenue from licensing (2X Innovation Value) from RESEARCH Sheet		6,944,325.00	7,418,030.00	7,891,734.00	8,365,440.00	8,839,144.00	9,312,850.00	48,771,523.00
cost of purchased items	40,000.00							
cost of implementation	20,644.00							
Total cost	60,644.00							
Total Benefits	50,116,283.68							50,116,283.68
Total Cost	311,166.20							
Net present Value (over 6 years)	49,805,117.48							
Estimated Growth (6 years)	57,275,885.10	Return On Investment (ROI)						16006%

Updated Costs for Entire Web Portal System

	Cost per Unit	Number of Units	Total Cost
Server			
<i>Dell Power Edge 840</i>			
<i>Intel Core Duo 2.2GHz</i>			
<i>4GB memory</i>			
<i>Ethernet Network Adapter (2)</i>			
<i>1TB 7.2K RPM Hard Drive (4)</i>			
<i>Tape Backup</i>			
<i>Firewall and Antivirus</i>	12,380	1	12,380
			12,380
Workstations			
<i>Dell Precision T7400</i>			
<i>Dual Core Intel 3.33GHz (2)</i>			
<i>Windows Vista Ultimate Bonus</i>			
<i>ATI Fire V7600 Graphic Card</i>			
<i>2GB memory</i>			
<i>16X DVD+/-RW</i>			
<i>1TB 7200 RPM Hard Drive</i>			
<i>Wireless Router</i>			
<i>Microsoft Office 2007</i>			
<i>Autodesk AutoCAD 2008</i>	13,004	10	130,040
			130,040
Switches			
<i>Dell PowerConnect 6224</i>			
<i>w/ uplink modules and cables</i>	1,849	1	1,849
			1,849
Printers			
<i>Dell Color Laser 5110cn</i>			
<i>w/ 1GB memory</i>	1,509	6	9,054
			9,054
Cables and accessories			2,000
Total Cost of Purchased Items			155,323

Industrial Carbon Composites					
Descripti	Total #	Low	Med	High	Total
Inputs	30	15x3	10x4	5x6	115
Outputs	26	12x4	10x5	5x7	133
Queries	26	12x3	8x4	6x6	104
Files	7	0x7	6x10	1x15	75
Total Unadjusted Function Points					427
Total Design Influence					44
Value Adjustment Factor					1.09
Total Adjusted Function Points					465.43
Lines of Code		C++	23272		
Effort in Person Months					32.58

Cost of Implementing System	
Effort in Person Months	32.580
Number of Programmers	4.000
Effort in Person Months / 4	8.145
x 4 weeks	4.000
	32.580
x 160 hrs. / week	160.000
	5,212.816
x \$25.00 hr.	30.000
Total cost for implementing system	156,384.480

GSC	Degree of Influence
Data Communications	3
Heavy use configuration	2
Transaction rate	3
End-user efficiency	2
Complex processing	5
Installation ease	4
Multiple sites	3
Performance	3
Distributed functions	3
Online data entry	5
Reusability	3
Operational ease	4
Extensibility	4
Total Degree of Influence	44

inputs	outputs	files	queries
Customer ID New customer information Potential Part idea Part ID CAD drawing Potential Order Existing Engineer ID New Engineer ID Engineer ID Design response Bid Formal design New contract information (incl. date/time) Order Order schedule Fabrication shop availability Outsource facility availability Automatic lead- time message Purchase order Supplier ID Supply confirmation Outsource facility ID Outsource facility schedule confirmation Material handling tool consignment Order schedule (changed) Order change Order acceptance/ confirmation Order cancellation Emergency report Shipping costs	New Customer ID Bid Potential order Order number Ordering schedule Design Part cost Final design Machine reservation Contract ID Master schedule Order schedule Supplier contact Purchase order Outsource facility contact Material handling tool consignment New order schedule Revised order / machine schedule Order cancellation / machine schedule Outsource facility contact Job status New part information Manufacturing / design costs Shipping costs Invoice New part information	Customer file Part file Order file Schedule file Job costs Outsource file Supplier file	Customer information (incl. date/time) New Customer ID Part information Part ID Manufacturing requirements CAD drawing Machine reservation (tentative) Potential order Material requirements Design Design response Engineer information Part cost Formal Design Machine reservation Contract ID Order number Machine reservation conflict Machine open Fabrication shop schedule Outsource facility schedule Material requirements Supplier information Environmental requirements Performance requirements Job status Technical information Part drawing (final)

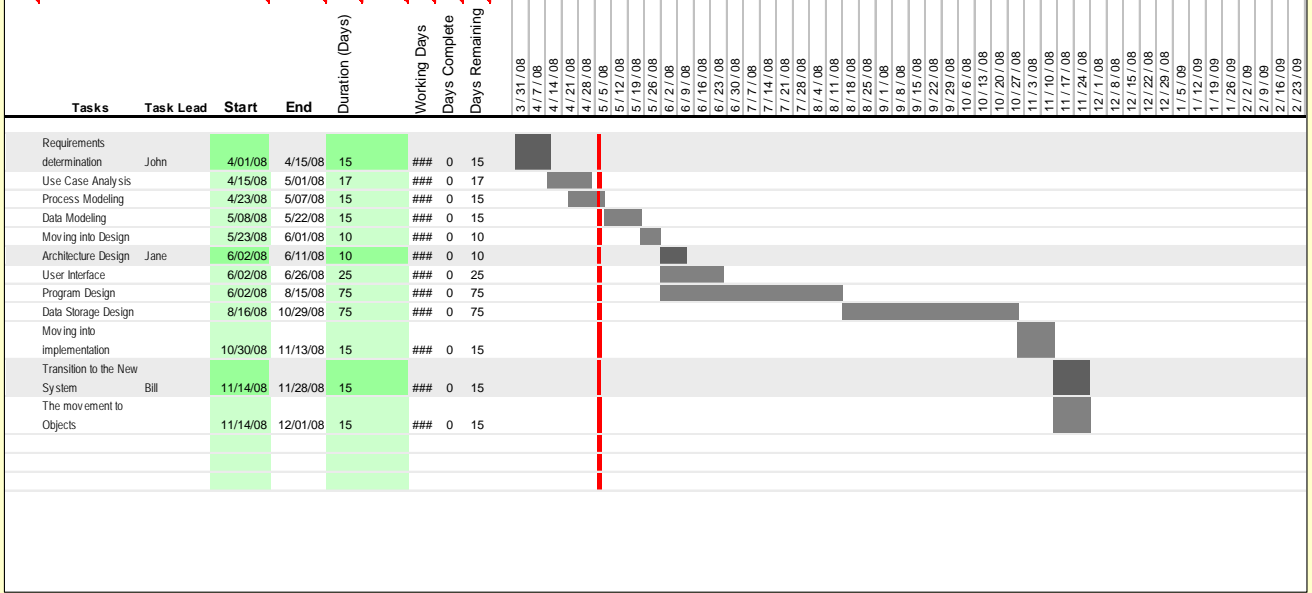
Project Name

Company Name

Project Lead: Group D

Today's Date: 5/6/2008 (vertical red line)

Start Date: 4/1/2008 (Tue)



Triggers:

- 1) Customer contacts web portal (with part idea)
- 2) Customer sends drawings
- 3) Potential order is received
- 4) Collaboration of engineers
- 5) Design is finalized
- 6) New order is recognized
- 7) Scheduling conflict
- 8) Order is received
- 9) (Temporal) Lead time for job
- 10) Material order (is cleared by supplier)
- 11) Research group checks database for existing part information
- 12) Unexpected influx of work
- 13) Work is outsourced
- 14) Change / cancellation of order
- 15) Emergency / machine failure
- 16) Customer checks status of job
- 17) Job is completed (shipped and billed)
- 18) New technical information is entered into web portal

ICC - Late penalty savings by implementing manufacturing systems												
Division of Benefits Per System:	Job-tracking	30%	Inventory:	40%	Rescheduling/ Emergency Outsourcing:	30%	100%					
Late penalty from:	15%	6 year forecast										
To:	5%											
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Number of orders	386	332	341	369	323	360	339	347	346	346	342	350
Average price per unit	25.11	23.56	25.79	25.54	26.93	27.08	25.69	25.71	26.21	26.30	26.32	25.77
Average units per order	520	550.00	614.00	499.00	532.00	496.00	534.96	538.36	544.12	527.37	541.23	544.65
Average price per order	13,057.20	12,958.00	15,835.06	12,744.46	14,326.76	13,431.68	13,721.00	13,778.29	13,955.26	13,871.62	13,912.54	13,822.97
Number of late orders (15%)	57.9	49.80	51.15	55.35	48.45	54.00	52.78	52.03	52.67	52.31	52.78	52.92
Total price of late orders (15%)	756,011.88	645,308.40	809,963.32	705,405.86	694,131.52	725,310.72	722,723.52	720,740.20	729,067.49	716,871.21	722,742.98	722,966.76
Total penalties for late delivery (15%)	451,200.00	460,345.00	480,567.00	500,987.00	501,345.00	543,276.00	489,619.57		505,029.04	511,256.16	512,079.46	511,937.27
Percent of late charge	59.7%	71%	59%	71%	72%	75%	68%	69%	66%	68%	67%	66%
Number of late orders (5%)	19.3	16.60	17.05	18.45	16.15	18.00	17.59	17.28	17.39	17.43	17.31	17.43
Total price of late orders (5%)	252,003.96	215,102.80	269,987.77	235,135.29	231,377.17	241,770.24	240,896.22	240,236.97	243,018.64	239,021.35	241,103.83	241,117.34
Total penalties (5%)	150,400.00	153,448.33	160,189.00	166,995.67	167,115.00	181,092.00	163,206.67	165,506.37	167,826.11	169,366.84	169,505.98	169,301.65
Total late penalty savings (10%)	300,800.00	306,896.67	320,378.00	333,991.33	334,230.00	362,184.00	326,413.33	326,413.33	325,512.00	323,349.61	320,717.37	317,271.11
Job-Tracking Penalty Savings	90,240.00	92,069.00	96,113.40	100,197.40	100,269.00	108,655.20	97,924.00	97,924.00	97,653.60	97,004.88	96,215.21	95,181.33
Inventory Penalty Savings	120,320.00	122,758.67	128,151.20	133,596.53	133,692.00	144,873.60	130,565.33	130,565.33	130,204.80	129,339.84	128,286.95	126,908.45
Outsourcing Penalty Savings	90,240.00	92,069.00	96,113.40	100,197.40	100,269.00	108,655.20	97,924.00	97,924.00	97,653.60	97,004.88	96,215.21	95,181.33
Revenue from Production Shop	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Forecast 2008 - 2013	5,040,079.00	4,301,600.00	5,398,709.00	4,703,074.00	6,427,973.00	4,835,583.00	5,583,936.73	5,484,788.06	5,426,828.63	5,388,398.59	5,675,582.55	5,145,227.41
Current Growth Rate	0.9%											
Doubling growth rate by implementing Systems	1.8%											
Forecasted revenue (double growth rate)							5,683,400.78	5,582,486.01	5,523,494.18	5,484,379.60	5,776,679.03	5,236,876.93
Increase in revenue							99,464.04	97,697.95	96,665.55	95,981.01	101,096.49	91,649.52
Increase Due to Job-Tracking System							29,839.21	29,309.39	28,999.66	28,794.30	30,328.95	27,494.86
Increase Due to Inventory System							39,785.62	39,079.18	38,666.22	38,392.41	40,438.59	36,659.81
Increase Due to Outsourcing System							29,839.21	29,309.39	28,999.66	28,794.30	30,328.95	27,494.86

Benefits		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Number of orders		57.00	101.00	130.00	142.00	113.00	154.00	169.47	162.43	157.39	153.15	148.66	160.98
Total Revenue		4,880,000.00	7,654,923.00	6,651,295.00	8,356,921.00	6,324,904.00	8,964,539.00	8,952,590.07	8,631,532.27	8,594,346.69	8,419,782.61	8,185,433.51	8,861,752.68
Gross Profit		730,255.00	3,250,305.00	1,938,675.00	3,227,867.00	1,003,291.00	3,306,914.00	2,986,029.00	2,658,758.33	2,742,192.54	2,685,848.81	2,472,533.89	3,022,527.34
Sole-source orders	60%	34.20	60.60	78.00	85.20	67.80	92.40	101.68	97.46	94.43	91.89	89.20	96.59
Gross Profit of sole source orders		438,153.00	1,950,183.00	1,163,205.00	1,936,720.20	601,974.60	1,984,148.40	1,791,617.40	1,595,255.00	1,645,315.52	1,611,509.28	1,483,520.33	1,813,516.41
Sole-source orders with system implemented	80%	45.60	80.80	104.00	113.60	90.40	123.20	135.57	129.95	125.91	122.52	118.93	126.78
Gross Profit with increase		584,204.00	2,600,244.00	1,550,940.00	2,582,293.60	802,632.80	2,645,531.20	2,388,823.20	2,127,006.67	2,193,754.03	2,148,679.05	1,978,027.11	2,418,021.87
Profit as sole-source supplier increase:	150%	876,306.00	3,900,366.00	2,326,410.00	3,873,440.40	1,203,949.20	3,968,296.80	3,583,234.80	3,190,510.00	3,290,631.04	3,223,018.57	2,967,040.67	3,627,032.81
Gross profit per average job		15,373.79	38,617.49	17,895.46	27,277.75	10,654.42	25,768.16	21,144.19	19,641.77	20,907.61	21,044.31	19,958.41	22,531.61
Benefit from designing material handlingtools	15%												
Cost per order (Mfg. group) of development for handling tools		4,234.00	3,874.00	3,901.00	4,176.00	4,225.00	3,995.00	4,080.80	4,139.47	4,115.21	4,115.13	4,113.63	4,064.41
Savings per order (Mfg. group)from Custom-Design group design		635.10	581.10	585.15	626.40	633.75	599.25	612.12	620.92	617.28	617.27	617.04	609.66
Total savings		36,200.70	58,691.10	76,069.50	88,948.80	71,613.75	92,284.50	103,733.94	100,859.09	97,153.52	94,537.30	91,730.48	98,140.47

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
New innovations	3	4	3	4	4	5	3	4	3	4	4	4
Total innovations (cumulative)	23	27	30	34	38	43	46	50	53	57	61	65
Total revenue from licensing	1,730,234.00	2,563,287.00	2,658,345.00	2,785,094.00	3,002,134.00	3,125,432.00	3,472,162.50	3,709,015.00	3,945,867.00	4,182,720.00	4,419,572.00	4,656,425.00
Value of average innovation	75,227.57	94,936.56	88,611.50	81,914.53	79,003.53	72,684.47	75,481.79	74,180.30	74,450.32	73,381.05	72,452.00	71,637.31
Double value of average innovation	150,963.59	149,360.60	148,900.64	146,762.11	144,904.00	143,274.62	150,963.59	149,360.60	148,900.64	146,762.11	144,904.00	143,274.62
Total revenue from licensing (2X inv. Value)	6,944,325.00	7,418,030.00	7,891,734.00	8,365,440.00	8,839,144.00	9,312,850.00	6,944,325.00	7,418,030.00	7,891,734.00	8,365,440.00	8,839,144.00	9,312,850.00
less cost	663,203.00	673,072.00	688,041.00	737,279.00	770,530.00	759,184.00	797,369.87	824,396.24	847,870.30	864,712.35	887,076.83	916,598.16
Net profit by doubling innovation value	6,146,955.13	6,593,633.76	7,043,863.70	7,500,727.65	7,952,067.17	8,396,251.84	6,146,955.13	6,593,633.76	7,043,863.70	7,500,727.65	7,952,067.17	8,396,251.84
Increase in business for Mfg. and Custom-Design Group:												
Gross profit Mfg. Group	235,322.00	150,669.00	861,458.00	105,769.00	441,979.00	512,452.00	534,997.27	555,637.38	484,954.24	665,242.81	637,990.37	659,986.88
Gross profit Custom-design Group	730,255.00	3,250,305.00	1,938,675.00	3,227,867.00	1,003,291.00	3,306,914.00	2,986,029.00	2,674,722.93	3,048,751.36	3,087,712.47	3,618,201.46	3,343,940.15
5%	48,278.85	170,048.70	140,006.65	166,681.80	72,263.50	190,968.30	176,051.31	161,518.02	176,685.28	187,647.76	212,809.59	200,196.35
10%	96,557.70	340,097.40	280,013.30	333,363.60	144,527.00	381,936.60	352,102.63	323,036.03	353,370.56	375,295.53	425,619.18	400,392.70

Estimated Costs			
System	Cost per Unit	Number of Units	Total Cost
Job Tracking			
Servers	5,000	1	5,000
Workstations	2,000	5	10,000
Total Cost for System			15,000
Inventory			
Servers	5,000	1	5,000
Workstations	2,000	1	2,000
Total Cost for System			7,000
Outsource			
Servers	5,000	1	5,000
Workstations	2,000	5	10,000
Total Cost for System			15,000
CAD Exchange			
Servers	5,000	1	5,000
Workstations	2,000	5	10,000
Cad Software	2,000	1	2,000
Total Cost for System			17,000
Web Portal			
Servers	5,000	2	10,000
Workstations	2,000	15	30,000
Total Cost for System			40,000
Total Cost			94,000

Electronic Design Exchange

<i>Description</i>	<i>Total #</i>	<i>Low</i>	<i>Med</i>	<i>High</i>	<i>Total</i>
<i>Inputs</i>	4	3x3	1x4	0x6	13
<i>Outputs</i>	3	1x4	2x5	0x7	14
<i>Queries</i>	3	2x3	1x4	0x6	45
<i>Files</i>	4	0x7	3x10	1x15	10
Total Unadjusted Function Points					82
Total Design Influence					7
Value Adjustment Factor					0.72
Total Adjusted Function Points					59.04
Lines of Code		C++			2952
Effort in Person Months					4.133

Outsourcing

<i>Description</i>	<i>Total #</i>	<i>Low</i>	<i>Med</i>	<i>High</i>	<i>Total</i>
<i>Inputs</i>	6	3x3	1x4	2x6	25
<i>Outputs</i>	5	1x4	2x5	2x7	28
<i>Queries</i>	4	2x3	1x4	1x6	16
<i>Files</i>	3	1x7	1x10	1x15	32
Total Unadjusted Function Points					101
Total Design Influence					8
Value Adjustment Factor					0.73
Total Adjusted Function Points					73.73
Lines of Code		C++			3687
Effort in Person Months					5.161

Inventory System

<i>Description</i>	<i>Total #</i>	<i>Low</i>	<i>Med</i>	<i>High</i>	<i>Total</i>
<i>Inputs</i>	6	3x3	2x4	1x6	23
<i>Outputs</i>	4	2x4	2x5	0x7	18
<i>Queries</i>	3	1x3	0x4	2x6	15
<i>Files</i>	4	1x7	0x10	3x15	52
Total Unadjusted Function Points					108
Total Design Influence					10
Value Adjustment Factor					0.75
Total Adjusted Function Points					81
Lines of Code		C++			4050
Effort in Person Months					5.67

Job Tracking System

<i>Description</i>	<i>Total #</i>	<i>Low</i>	<i>Med</i>	<i>High</i>	<i>Total</i>
<i>Inputs</i>	8	2x3	4x4	2x6	34
<i>Outputs</i>	3	0x4	2x5	1x7	17
<i>Queries</i>	5	2x3	2x4	1x6	20
<i>Files</i>	4	2x7	1x10	1x15	39
Total Unadjusted Function Points					110
Total Design Influence					18
Value Adjustment Factor					0.83
Total Adjusted Function Points					91.3
Lines of Code	C++				4565
Effort in Person Months					6.391

<i>Web Portal</i>					
<i>Description</i>	<i>Total #</i>	<i>Low</i>	<i>Med</i>	<i>High</i>	<i>Total</i>
<i>Inputs</i>	15	2x3	4x4	2x6	36
<i>Outputs</i>	12	0x4	2x5	1x7	60
<i>Queries</i>	15	2x3	2x4	1x6	68
<i>Files</i>	20	2x7	1x10	1x15	235
Total Unadjusted Function Points					399
Total Design Influence					30
Value Adjustment Factor					0.95
Total Adjusted Function Points					379.1
Lines of Code	Java				20848
Effort in Person Months					29.19