

IDP Costing Module

The following series of linked worksheets are a simple cost calculator to aid the understanding of cost distribution in producing IDP type AGVs. In addition, the module gives an estimate of the costs/unit for a small production run based on the prototype using some industrial derived costing models for the savings generated and sales costs typically incurred. NB This module should not be used for absolute costings for a project, but as a indication of the relative importance of individual cost centres.

Usage To obtain an estimate the user is required to enter information about the time and components that have been used to produce the prototype. The module then uses a number of predefined costing factors to calculate the overall cost of the prototype and estimates for small production runs of 100 and 1000 off.

Layout The general layout of the individual worksheets is normally fixed with the user only expected to interact with a limited number of colour coded cells

Cells coloured green are the primary cells requiring updating by the user. [Should the be no time allocated to a task or no components used, set the field to 0 or leave blank]

Turquoise coloured cells contain typical industrial wage costs and overall factors used to calculate savings etc when bulk buying components / services. It is expected that these values will not normally require changing.

Yellow cells contain calculated (sub-) totals and should not be changed, but used in subsequent analyses

Worksheets

Summary The Summary sheet gives the user a simplified view of the important cost centres and areas where significant savings can be achieved.

Labour The sheet generates the costs involved in producing the IDP prototype. It requires data obtained from the IDP time sheets to be entered to also give information of time/cost distributions across disciplines. NB Costs are based on teams of 6 (7) + specific consultant cost. Teams will be notified on the night before the competition, via the forums, of any consultant costs

Mechanical Costs of the major mechanical components. Specific manufacturing costs will be posted on the forums at the end of week four of an IDP course.

Electrical Costs of the major Electrical components.

Software Costs of the major Software system costs.

Post Dev Estimation of the time and costs involved in running a sales and production team to support the selling of AGVs for a year leading up to and following a production launch.

IDP Costing Summary

Team L101
Date 05/11/12

Prototype/Engineering Labour Costs

	Design		Construction		Testing		Admin/Doc		Total Hrs (/72)
	Hrs	Cost	Hrs	Cost	Hrs	Cost	Hrs	Cost	
Week 1	0.3	£60	0	£0	0	£0	0	£0	0.3
Week 2	0	£0	0	£0	0	£0	0	£0	0
Week 3	0	£0	0	£0	0	£0	0	£0	0
Week 4	0	£0	0	£0	0	£0	0	£0	0
Week 5	0	£0	0	£0	0	£0	0	£0	0
Total	0.3	£60	0	£0	0	£0	0	£0	0.3 (/ 300)

Production Labour costs

100 off	(each)	£0	50%	£0	20%	£0	20%	£0
1000 off	(each)	£0	35%	£0	10%	£0	5%	£0

Component Costs

		Mechanical		Sheet		Sub-con	Pneumatics	Gears & Wheels		Motors	Extras
		Fasteners	Materials	Materials	Materials			Wheels	Wheels		
Total (One Off)	(each)	£348	£2.30	£0.00	£20.00	£160.80	£13	£152.00	£0.00		
Total (100 Off)	(each)	£313	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%		
Total (1000 Off)	(each)	£220	40.0%	50.0%	50.0%	70.0%	40.0%	60.0%	50.0%		

		Electrical		PCBs	Passives	Connectors	Semis	Sensors	LEDs	Extras
		Materials	Materials							
Total (One Off)	(each)	£70	£14.10	£0.40	£3.00	£2.20	£50.00	£0.24	£0.00	
Total (100 Off)	(each)	£63	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	
Total (1000 Off)	(each)	£31	50.0%	50.0%	60.0%	75.0%	40.0%	70.0%	50.0%	

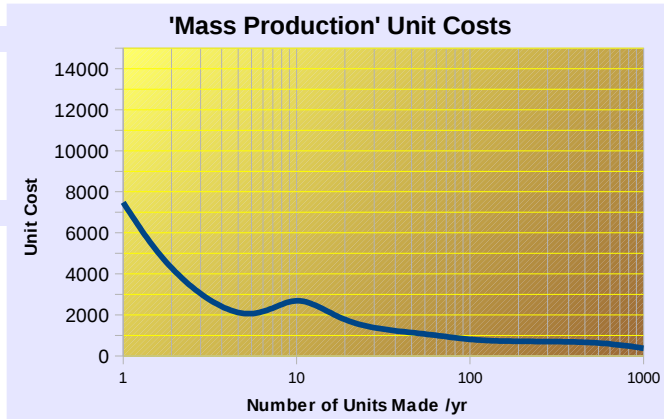
		Software		Micro	Interface	Power Supply	Extras
		Materials	Materials				
Total (One Off)	(each)	£297	£270	£6	£21	£0.00	
Total (100 Off)	(each)	£240	80.0%	80.0%	90.0%	0.0%	
Total (1000 Off)	(each)	£109	35.0%	35.0%	60.0%	0.0%	

Startup Costs

Mechanical	£2,000	one off	[e.g. Tools etc]
Electrical	£2,500	one off	[e.g. Instruments (Oscilloscope/PS/SigGen...), soldering iron]
Software	£1,500	one off	[e.g. PC, Software, test boards]

Totals		
Prototype	£6,775	each

Post Development Fixed Costs		
Staff	£0	/yr
Accommodation	£0	/yr
Publicity etc	£7,000	/yr



IDP Development Labour Costs

	Mechanical				Electrical				Software			
	Design Hours	Construction Hours	Testing Hours	Admin/Docs Hours	Design Hours	Construction Hours	Testing Hours	Admin/Docs Hours	Design Hours	Construction Hours	Testing Hours	Admin/Docs Hours
Hourly Rate (ukp)	£50	£30	£40	£20	£50	£30	£40	£20	£50	£30	£40	£20
Consultant	£200	£50	£120	£30	£200	£50	£120	£30	£200	£50	£120	£30
Week 1	CRSid											
Staff 1												
Staff 2												
Staff 3												
Staff 4												
Staff 5												
Staff 6												
Staff 7												
Consultant	0.3											
Total (/72)	0.3	0.3	0	0	0	0	0	0	0	0	0	0
Cost (ukp)	£60	£60	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Week 2												
Staff 1												
Staff 2												
Staff 3												
Staff 4												
Staff 5												
Staff 6												
Staff 7												
Consultant												
Total	0	0	0	0	0	0	0	0	0	0	0	0
Cost	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Week 3												
Staff 1												
Staff 2												
Staff 3												
Staff 4												
Staff 5												
Staff 6												
Staff 7												
Consultant												
Total	0	0	0	0	0	0	0	0	0	0	0	0
Cost	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Week 4												
Staff 1												
Staff 2												
Staff 3												
Staff 4												
Staff 5												
Staff 6												
Staff 7												
Consultant												
Total	0	0	0	0	0	0	0	0	0	0	0	0
Cost	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0
Week 5												
Staff 1												
Staff 2												
Staff 3												
Staff 4												
Staff 5												
Staff 6												
Staff 7												
Consultant												
Total	0	0	0	0	0	0	0	0	0	0	0	0
Cost	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0

Mechanical Component Costs

	Unit	Used	Cost/Unit	Cost
Sheet Materials				
Steel Sheet (0.7mm)	m ²		£5.00	£0.00
Al Sheet	m ²		£10.00	£0.00
Al Angle	m		£1.50	£0.00
Total				£0.00
Sub Con				
Water Jet	(quote)			£0.00
Painting	(quote)			£0.00
Machining	(quote)			£0.00
Rapid Prototyping	(quote)			£0.00
Welds	each		£0.05	£0.00
Total				£0.00
Fasteners				
Rivets	each	0	£0.10	£0.00
Bolts				
	2.5mm each	0	£0.05	£0.00
	3.0mm each	0	£0.06	£0.00
	4.0mm each	0	£0.08	£0.00
	5.0mm each	0	£0.08	£0.00
	6.0mm each	0	£0.09	£0.00
Studding				
	3.0mm m	0.5	£3.00	£1.50
	4.0mm m		£3.50	£0.00
	5.0mm m	0.2	£4.00	£0.80
	6.0mm m		£4.50	£0.00
Total				£2.30
Pneumatics				
Pilot Valves (inc conn)	each	2	£45.00	£90.00
Actuators (inc conn)	each	2	£35.00	£70.00
Pipe	/m	1	£0.80	£0.80
Total				£160.80
Gears & Wheels				
Wheel 100mm	each	2	£6.50	£13.00
Wheel 75mm	each		£5.65	£0.00
Wheel 50mm	each		£4.80	£0.00
Gear 50tooth	each	0	£0.50	£0.00
Gear 40 tooth	each	0	£0.45	£0.00
Gear 30 tooth	each	0	£0.30	£0.00
Gear 20 tooth	each	0	£0.25	£0.00
Gear 10 tooth	each	0	£0.25	£0.00
Gear Mitre	each	0	£0.60	£0.00
Total				£13.00
Motors				
Large (Maxon) 40/20	each	2	£76.00	£152.00
Small (McLennan) 40/20	each		£14.50	£0.00
Total				£152.00
Extras (S)				
User – 1	each	1	£0.00	£0.00
User – 2	each	1	£0.00	£0.00
User – 3	each	1	£0.00	£0.00
User – 4	each	1	£0.00	£0.00
Total				£0.00

Electrical Component Costs

	Unit	Used	Cost/Unit	Cost
PCBs				
Line Following	each	1	£6.50	£6.50
Prototype	each	1	£7.60	£7.60
			Total	£14.10
Passives				
Resistors	(quote)	10	£0.02	£0.20
Capacitors	(quote)	2	£0.10	£0.20
			Total	£0.40
Connectors				
D Plug/Socket	each	2	£0.70	£1.40
Molex Pins	each	2	£0.40	£0.80
Molex Body	each	2	£0.30	£0.60
Molex Crimps	each	10	£0.02	£0.20
			Total	£3.00
Semis				
FET	each	2	£0.30	£0.60
HC 74	each	2	£0.40	£0.80
PCF8574	each	1	£0.80	£0.80
			Total	£2.20
Sensors				
Optical (Line)	each	4	£2.25	£9.00
Strain gauge	each		£4.50	£0.00
Magnetic	each		£4.00	£0.00
Temperature	each		£2.00	£0.00
			Total	£9.00
LEDs				
3mm (Low current)	each	6	£0.04	£0.24
			Total	£0.24
Extras (S)				
User – 1	each	1	£0.00	£0.00
User – 2	each	1	£0.00	£0.00
User – 3	each	1	£0.00	£0.00
User – 4	each	1	£0.00	£0.00
			Total	£0.00

Software Component Costs

	Unit	Used	Cost/Unit	Cost
Micro				
Balloon	each	1	£250.00	£250.00
Case	each	1	£20.00	£20.00
Total				£270.00
Interfaces				
Motor Conn	each	1	£6.00	£6.00
	each			£0.00
Total				£6.00
Power Supply				
P/S	each	1	£20.00	£20.00
Leads	each	1	£1.00	£1.00
Total				£21.00
Extras (S)				
User – 1	each	1	£0.00	£0.00
User – 2	each	1	£0.00	£0.00
User – 3	each	1	£0.00	£0.00
User – 4	each	1	£0.00	£0.00
Total				£0.00

Post Development Costs

	Unit	Used	Cost/Unit	Cost
Staff				
Sales	weeks/yr		£800.00	£0.00
Production	weeks/yr		£800.00	£0.00
			Total	£0.00
Accommodation (Hired)				
Office	sq m/yr		£80.00	£0.00
Workshop	sq m/yr		£80.00	£0.00
			Total	£0.00
Publicity / Travel etc				
Publicity	/yr	1	£5,000.00	£5,000.00
Travel	/yr	1	£2,000.00	£2,000.00
			Total	£7,000.00
Extras (S)				
User – 1	/yr	1	£0.00	£0.00
User – 2	/yr	1	£0.00	£0.00
User – 3	/yr	1	£0.00	£0.00
User – 4	/yr	1	£0.00	£0.00
			Total	£0.00