VISVESVARAYA TECHNOLOGICAL UNIVERSITY

BELGAUM 590014

Software Project Management and Finance

Alternative Assessment Report on

"CNC Drawing Machine with Cloud Computation"

By

Medhini Oak (1BM16CS047) **Deepthi Bhat (1BM16CS003)**
Aditi Awasthi (1BM16CS008)

Under the Guidance of

Rekha G S
Assistant Professor, Department of CSE
BMS College of Engineering

Software Project Management and Finance carried out at

Department of Computer Science and Engineering
B.M.S. College of Engineering
(Autonomous college under VTU)
P.O. Box No.: 1908, Bull Temple Road, Bangalore-560 019
2018-2019

B.M.S. COLLEGE OF ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CERTIFICATE

This is to certify that the Software Project Management and Finance titled "**CNC Drawing Machine with Cloud Computation**" has been carried out by **Medhini Oak (1BM16CS047), Deepthi Bhat (1BM16CS003) and Aditi Awasthi (1BM16CS008)** during the academic year 2018-2019.

Signature of the guide
Rekha G S
Assistant Professor
Department of Computer Science and Engineering
BMS College of Engineering, Bangalore

B.M.S. COLLEGE OF ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

DECLARATION

We, Medhini Oak (1BM16CS047), Deepthi Bhat (1BM16CS003) and Aditi Awasthi (1BM16CS008) students of 6th Semester, B.E, Department of Computer Science and Engineering, BMS College of Engineering, Bangalore, hereby declare that, this Software Project Management and Finance Alternative Assessment entitled "CNC Drawing Machine with Cloud Computation" has been carried out by us under the guidance of Mrs. Rekha.G.S, Assistant Professor, Department of CSE, BMS College of Engineering, Bangalore during the academic semester Jan-May 2019.
We also declare that to the best of our knowledge and belief, the development reported here is not from part of any other report by any other students.

Signature

Medhini Oak (1BM16CS047)

Deepthi Bhat (1BM16CS003)

Aditi Awasthi (1BM16CS008)

1. Short Description of the Project

CNC stands for Computer Numeric Control and typically refers to a machine whose operation is controlled by a computer. The most common usage of CNC, and the one relevant to us, is the name given to devices that, under computer control are able to cut, etch, mill, engrave, build, turn and otherwise perform manufacturing operations on various materials. By controlling a CNC machine through a PC it is possible for the user to design a product on-screen, convert it to CNC-readable code and then send that data to the CNC machine for it to produce a physical copy of the item designed.

A 2D CNC plotter offers a way to efficiently produce very large drawings. Pen plotters will be able to print by moving a pen or other writing device across the surface of a piece of paper. This means that plotters are vector graphics devices, rather than raster graphics. Pen plotters can draw complex line art, including text, but do so slowly because of the mechanical movement of the writing device such as pen.

The 2D Pen Plotter is based on the principle of Computer Numerical Control. It works with two stepper motors and a servo motor, wherein it plots the input given from the computer on the drawing board using ATMEGA 328p microcontroller. The plotter has a two axis control using two stepper motors and a special mechanism to raise and lower the pen, using a servo motor.

Using the Microsoft Azure Portal, a Windows 2012 R2 Server Virtual Machine is installed on the cloud. The virtual machine is configured with Internet Information Services (IIS) and FastCGI to facilitate online access to the project website.

The software used for programming the Arduino board are namely Inkscape (0.48.5), Processing (3.0.2), Arduino IDE. The correct and efficient arrangement and proper use of the programs along with the circuit makes up an efficient 2D CNC Plotter.

2. List of Task Names with start date and end date of each

1. ***Group Selection:*** This phase includes the formation of group to do the project.
    a) **Start Date:** 25th August 2018
    b) **End Date:** 28th August 2018

2. ***Group Discussion:*** This phase includes brainstorming by the group members and formulation a plan for implementation.
    a) **Start Date:** 29th August 2018
    b) **End Date:** 31st August 2018

3. ***Presentation:*** This phase includes formation of an initial presentation and planning of the upcoming tasks to be accomplished for the project.
    a) **Start Date:** 1st September 2018
    b) **End Date:** 2nd September 2018

4. ***Planning and Design:*** This phase involves the planning and the entire design of the project. The entire structure of the project along with its functionality is formulated in this phase.
    a) **Start Date:** 3rd September 2018
    b) **End Date:**16th September 2018

5. ***Implementation:*** Involves the assembling of hardware and writing of code for the project.
    a) **Start Date:** 17th September 2018
    b) **End Date:** 7th October 2018

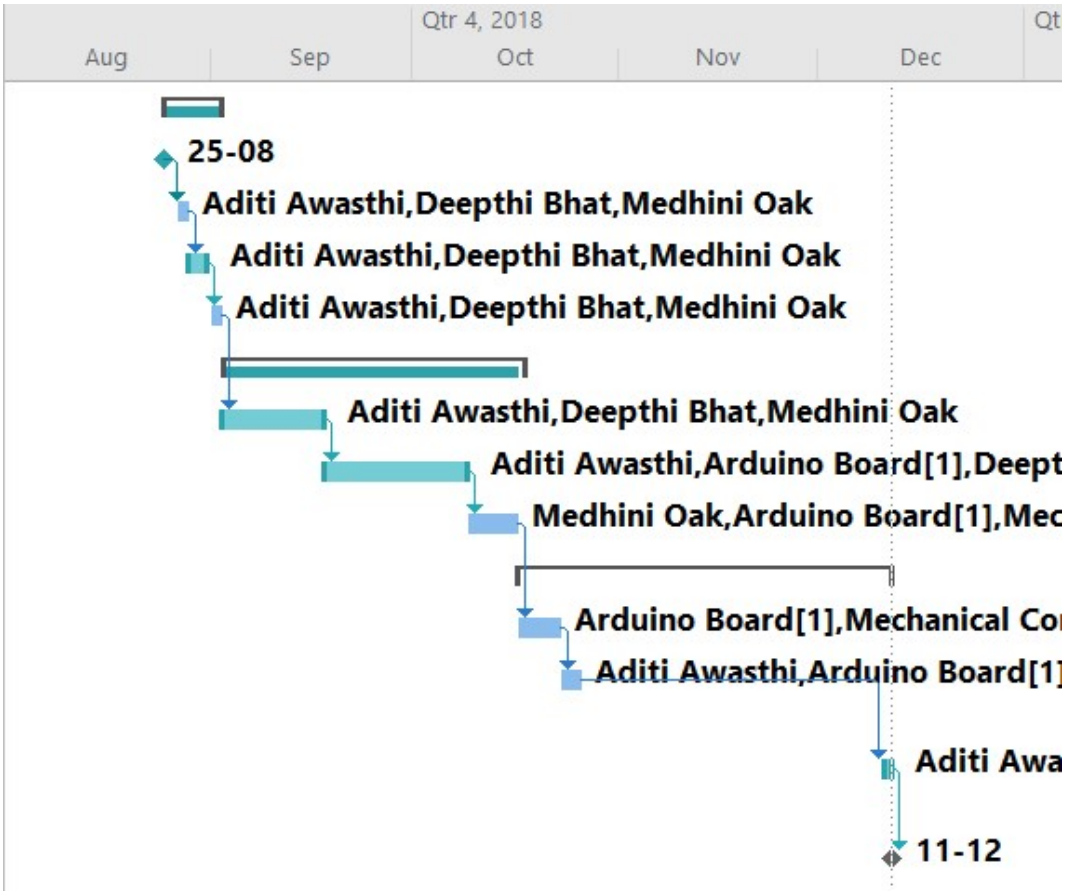
6. ***Testing:*** The project is tested to make sure all the functionalities work together to give a sophisticated system to the user.
    a) **Start Date:** 8th October 2018
    b) **End Date:** 15th October 2018

7. ***Internal Demonstration:*** Involves demonstration of the project to the guide before the external demonstration and implement any changes needed for further improvement of the project.
    a) **Start Date:** 16th October 2018
    b) **End Date:** 22nd October 2018

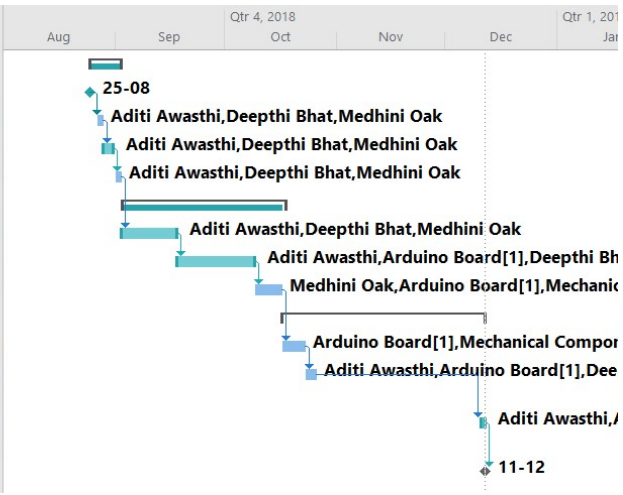
8. ***External Demonstration:*** The final stage where the project that was developed for the entire semester is demonstrated to an external examiner for evaluation.
    a) **Start Date:** 11th December 2018
    b) **End Date:** 11th December 2018

Gantt Chart with description of the Project

	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names
1		**Initial Planning**	**10 days**	**Sat 25-08-18**	**Sun 02-09-18**		
2		Start	0 days	Sat 25-08-18	Sat 25-08-18		
3		Group Selection	2 days	Mon 27-08-18	Tue 28-08-18	2	Aditi Awasthi,Deep
4		Group Discussion	4 days	Tue 28-08-18	Fri 31-08-18	3	Aditi Awasthi,Deep
5		Presentation	2 days	Sat 01-09-18	Sun 02-09-18	4	Aditi Awasthi,Deep
6		**Main Implementation**	**44 days**	**Mon 03-09-18**	**Wed 17-10-18**		
7		Planning	15 days	Sun 02-09-18	Mon 17-09-18	5	Aditi Awasthi,Deep
8		Design	21 days	Mon 17-09-18	Tue 09-10-18	7	Aditi Awasthi,Ardu
9		Implementation	7 days	Tue 09-10-18	Tue 16-10-18	8	Medhini Oak,Ardui
10		**End Presentation**	**53.67 days**	**Tue 16-10-18**	**Tue 11-12-18**		
11		Testing	6 days	Tue 16-10-18	Tue 23-10-18	9	Arduino Board[1],I
12		Internal Demonstration	4 days	Tue 23-10-18	Fri 26-10-18	11	Aditi Awasthi, Arduino Board[1],I
13		External Demonstration	1 day	Tue 11-12-18	Tue 11-12-18	12	Aditi Awasthi, Arduino Board[1],I
14		Finish	0 days	Tue 11-12-18	Tue 11-12-18	13	



	Task Name	Duration	Start	Finish	Predecessors	Resc
1	**Initial Planning**	**10 days**	**Sat 25-08-18**	**Sun 02-09-18**		
2	Start	0 days	Sat 25-08-18	Sat 25-08-18		
3	Group Selection	2 days	Mon 27-08-18	Tue 28-08-18	2	Aditi
4	Group Discussion	4 days	Tue 28-08-18	Fri 31-08-18	3	Aditi
5	Presentation	2 days	Sat 01-09-18	Sun 02-09-18	4	Aditi
6	**Main Implementation**	**44 days**	**Mon 03-09-18**	**Wed 17-10-18**		
7	Planning	15 days	Sun 02-09-18	Mon 17-09-18	5	Aditi
8	Design	21 days	Mon 17-09-18	Tue 09-10-18	7	Aditi
9	Implementation	7 days	Tue 09-10-18	Tue 16-10-18	8	Med
10	**End Presentation**	**53.67 days**	**Tue 16-10-18**	**Tue 11-12-18**		
11	Testing	6 days	Tue 16-10-18	Tue 23-10-18	9	Ardu
12	Internal Demonstration	4 days	Tue 23-10-18	Fri 26-10-18	11	Aditi Ardu
13	External Demonstration	1 day	Tue 11-12-18	Tue 11-12-18	12	Aditi Ardu
14	Finish	0 days	Tue 11-12-18	Tue 11-12-18	13	



Resource Sheet with Rate fixed for each resource based on their skill/cadre

	Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt. Rate	Cost/Use	Accrue	Base
1	Medhini Oak	Work		M		100%	₹ 20.00/hr	₹ 20.00/hr	₹ 0.00	Prorated	Standard
2	Aditi Awasthi	Work		A		100%	₹ 20.00/hr	₹ 20.00/hr	₹ 0.00	Prorated	Standard
3	Deepthi Bhat	Work		D		100%	₹ 20.00/hr	₹ 20.00/hr	₹ 0.00	Prorated	Standard
4	Arduino Board	Material		A			₹ 2,000.00		₹ 0.00	Prorated	
5	Stepper Motors	Material		S			₹ 1,000.00		₹ 0.00	Prorated	
6	Virtual Machine	Material		V			₹ 700.00		₹ 0.00	Prorated	
7	Mechanical Components	Material		M			₹ 1,000.00		₹ 0.00	Prorated	

Screen of Project statistics

Project Statistics for 'Project1.mpp'

	Start	Finish
Current	Sat 25-08-18	Wed 12-12-18
Baseline	Sat 25-08-18	Tue 11-12-18
Actual	Sat 25-08-18	Wed 12-12-18
Variance	0d	1.33d

	Duration	Work	Cost
Current	106.67d	960h	₹ 40,700.00
Baseline	105.33d	960h	₹ 40,700.00
Actual	106.67d	960h	₹ 40,700.00
Remaining	0d	0h	₹ 0.00

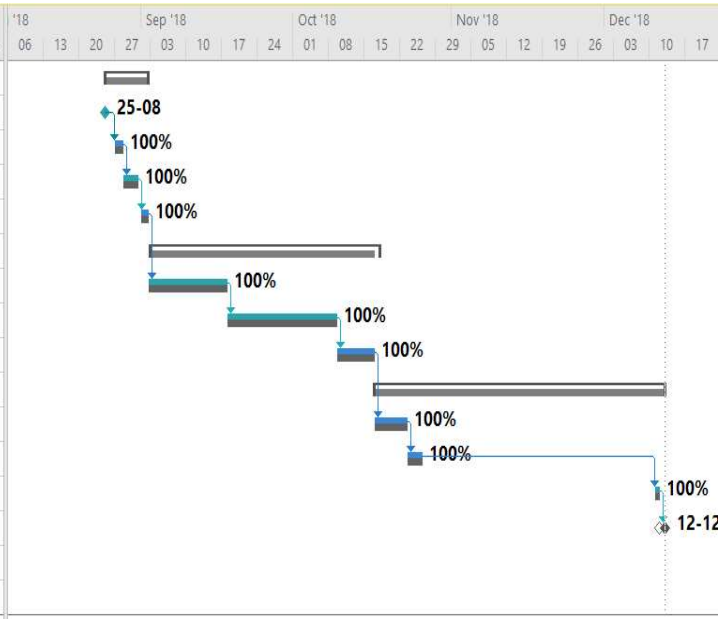
Percent complete:

Duration: 100% Work: 100%

Close

Gantt chart with Task Baseline

	Task Mode	Task Name	Duration	Start	Finish
1		**Initial Planning**	**10 days**	**Sat 25-08-18**	**Sun 02-09-18**
2		Start	0 days	Sat 25-08-18	Sat 25-08-18
3		Group Selection	2 days	Mon 27-08-18	Tue 28-08-18
4		Group Discussion	4 days	Tue 28-08-18	Fri 31-08-18
5		Presentation	2 days	Sat 01-09-18	Sun 02-09-18
6		**Main Implementation**	**44 days**	**Mon 03-09-18**	**Wed 17-10-18**
7		Planning	15 days	Sun 02-09-18	Mon 17-09-18
8		Design	21 days	Mon 17-09-18	Tue 09-10-18
9		Implementation	7 days	Tue 09-10-18	Tue 16-10-18
10		**End Presentation**	**55 days**	**Tue 16-10-18**	**Wed 12-12-18**
11		Testing	6 days	Tue 16-10-18	Tue 23-10-18
12		Internal Demonstratic	4 days	Tue 23-10-18	Fri 26-10-18
13		External Demonstratic	1 day	Tue 11-12-18	Tue 11-12-18
14		Finish	0 days	Wed 12-12-18	Wed 12-12-18



Cost table

	Task Name	Fixed Cost	Fixed Cost Accrual	Total Cost	Baseline	Variance	Actual	Remaining
1	**Initial Planning**	**₹ 0.00**	**Prorated**	**₹ 2,880.00**	**₹ 2,880.00**	**₹ 0.00**	**₹ 0.00**	**₹ 2,880.00**
2	Start	₹ 0.00	Prorated	₹ 0.00	₹ 0.00	₹ 0.00	₹ 0.00	₹ 0.00
3	Group Selection	₹ 0.00	Prorated	₹ 720.00	₹ 720.00	₹ 0.00	₹ 0.00	₹ 720.00
4	Group Discussion	₹ 0.00	Prorated	₹ 1,440.00	₹ 1,440.00	₹ 0.00	₹ 0.00	₹ 1,440.00
5	Presentation	₹ 0.00	Prorated	₹ 720.00	₹ 720.00	₹ 0.00	₹ 0.00	₹ 720.00
6	**Main Implementation**	**₹ 0.00**	**Prorated**	**₹ 21,200.00**	**₹ 21,200.00**	**₹ 0.00**	**₹ 0.00**	**₹ 21,200.00**
7	Planning	₹ 0.00	Prorated	₹ 5,400.00	₹ 5,400.00	₹ 0.00	₹ 0.00	₹ 5,400.00
8	Design	₹ 0.00	Prorated	₹ 10,260.00	₹ 10,260.00	₹ 0.00	₹ 0.00	₹ 10,260.00
9	Implementation	₹ 0.00	Prorated	₹ 5,540.00	₹ 5,540.00	₹ 0.00	₹ 0.00	₹ 5,540.00
10	**End Presentation**	**₹ 0.00**	**Prorated**	**₹ 16,620.00**	**₹ 16,620.00**	**₹ 0.00**	**₹ 0.00**	**₹ 16,620.00**
11	Testing	₹ 0.00	Prorated	₹ 5,420.00	₹ 5,420.00	₹ 0.00	₹ 0.00	₹ 5,420.00
12	Internal Demonstratic	₹ 0.00	Prorated	₹ 6,140.00	₹ 6,140.00	₹ 0.00	₹ 0.00	₹ 6,140.00
13	External Demonstratic	₹ 0.00	Prorated	₹ 5,060.00	₹ 5,060.00	₹ 0.00	₹ 0.00	₹ 5,060.00
14	Finish	₹ 0.00	Prorated	₹ 0.00	₹ 0.00	₹ 0.00	₹ 0.00	₹ 0.00

Tracking table

	Task Name	Act. Start	Act. Finish	% Comp.	Phys. % Comp.	Act. Dur.	Rem. Dur.	Act. Cost	Act. Work
1	**Initial Planning**	**Sat 25-08-18**	**Sun 02-09-18**	**100%**	**0%**	**10 days**	**0 days**	**₹ 2,880.00**	**144 hrs**
2	Start	Sat 25-08-18	Sat 25-08-18	100%	0%	0 days	0 days	₹ 0.00	0 hrs
3	Group Selection	Mon 27-08-18	Tue 28-08	100%	0%	2 days	0 days	₹ 720.00	36 hrs
4	Group Discussion	Tue 28-08-18	Fri 31-08-18	100%	0%	4 days	0 days	₹ 1,440.00	72 hrs
5	Presentation	Sat 01-09-18	Sun 02-09-18	100%	0%	2 days	0 days	₹ 720.00	36 hrs
6	**Main Implementati**	**Sun 02-09-18**	**Tue 16-10-18**	**100%**	**0%**	**44 days**	**0 days**	**₹ 21,200.00**	**690 hrs**
7	Planning	Sun 02-09-18	Mon 17-09-18	100%	0%	15 days	0 days	₹ 5,400.00	270 hrs
8	Design	Mon 17-09-18	Tue 09-10-18	100%	0%	21 days	0 days	₹ 10,260.00	378 hrs
9	Implementation	Tue 09-10-18	Tue 16-10-18	100%	0%	7 days	0 days	₹ 5,540.00	42 hrs
10	**End Presentation**	**Tue 16-10-18**	**Wed 12-12-18**	**100%**	**0%**	**55 days**	**0 days**	**₹ 16,620.00**	**126 hrs**
11	Testing	Tue 16-10-18	Tue 23-10-18	100%	0%	6 days	0 days	₹ 5,420.00	36 hrs
12	Internal Demonst	Tue 23-10-18	Fri 26-10-18	100%	0%	4 days	0 days	₹ 6,140.00	72 hrs
13	External Demonst	Tue 11-12-18	Tue 11-12-18	100%	0%	1 day	0 days	₹ 5,060.00	18 hrs
14	Finish	Wed 12-12-18	Wed 12-12-18	100%	0%	0 days	0 days	₹ 0.00	0 hrs

Work table

	Task Name	Work	Baseline	Variance	Actual	Remaining	% W. Comp.
1	**Initial Planning**	**144 hrs**	**144 hrs**	**0 hrs**	**144 hrs**	**0 hrs**	**100%**
2	Start	0 hrs	0 hrs	0 hrs	0 hrs	0 hrs	100%
3	Group Selection	36 hrs	36 hrs	0 hrs	36 hrs	0 hrs	100%
4	Group Discussion	72 hrs	72 hrs	0 hrs	72 hrs	0 hrs	100%
5	Presentation	36 hrs	36 hrs	0 hrs	36 hrs	0 hrs	100%
6	**Main Implementation**	**690 hrs**	**690 hrs**	**0 hrs**	**690 hrs**	**0 hrs**	**100%**
7	Planning	270 hrs	270 hrs	0 hrs	270 hrs	0 hrs	100%
8	Design	378 hrs	378 hrs	0 hrs	378 hrs	0 hrs	100%
9	Implementation	42 hrs	42 hrs	0 hrs	42 hrs	0 hrs	100%
10	**End Presentation**	**126 hrs**	**126 hrs**	**0 hrs**	**126 hrs**	**0 hrs**	**100%**
11	Testing	36 hrs	36 hrs	0 hrs	36 hrs	0 hrs	100%
12	Internal Demonstratic	72 hrs	72 hrs	0 hrs	72 hrs	0 hrs	100%
13	External Demonstratic	18 hrs	18 hrs	0 hrs	18 hrs	0 hrs	100%
14	Finish	0 hrs	0 hrs	0 hrs	0 hrs	0 hrs	100%