CNC PROGRAMMING

1. INTRODUCTION:

CNC programming is not a difficult task as many think, for beginners it will be useful if they divide the drawing in some smaller parts and start programming them. Actually CNC programming takes some time to master, but in short it is just a path for our tool to machine.
CNC (Computer Numerical Control machines) are widely used in manufacturing industry. Traditional machines such as vertical millers, center lathes, shaping machines, routers etc. operated by a trained engineer have, in many cases, been replaced by computer control machines. So CNC Programming is very good project.

With the present market evolution, one is immersed in providing CNC Programming. With the aid of team of skillful personnel, one can render these services according to the requirements of customers. Additionally, it uses innovative techniques and machines with high precision in order to execute these services. One can make a difference through introducing a range of Rapid Prototyping and 3D printing solutions.

2. SERVICE & ITS APPLICATION:

Training in the use of CNC's is available through the use of 'virtual software'. This is software that allows the operator to practice using the CNC machine on the screen of a computer. The software is similar to a computer game. CNC machines can be programmed by advanced design software such as Pro/DESKTOP®, enabling the manufacture of products that cannot be made by manual machines, even those used by skilled designers / engineers. Modern design software allows the designer to simulate the manufacture of his/her idea. There is no need to make a prototype or a model. This saves time and money. One person can supervise many CNC machines as once they are programmed they can usually be left to work by themselves. Sometimes only the cutting tools need replacing occasionally. A skilled engineer can make the same component many times. However, if each component is carefully studied, each one will vary slightly. A CNC machine will manufacture each component as an exact match. Lead to unemployment. Many countries no longer teach pupils / students how to use manually operated lathes / milling machines etc... Pupils / students no longer develop the detailed skills required by engineers of the past. These include mathematical and engineering skills.

3. DESIRED QUALIFICATIONS FOR PROMOTER:

Promoter for this service may have any graduation in computer science as well as High Visualization skills plus Management in operations can be a value added plus point so that it brings down the cost of building project and also make the implementation smoother and it will require less time to build with greater quality. Knowledge of mechanical design, operation and drawing plus CNC machine, plastic and metal quality is advantage.

4. INDUSTRY LOOK OUT AND TRENDS

The Computer Numerical Control (CNC) machine market size was valued at USD 56.04 billion in 2016 and is anticipated to witness lucrative growth over the forecast period. Increasing advancements in production technology have led to a reduction in time required for manufacturing components along with improved

ability to produce components with better surface finish. This is anticipated to drive the demand for CNC machines across the globe.

Evolution of Internet of Things (IoT) and machine learning technology has led to development of applications that notify the status of a machine to operators/supervisors on their PCs or smartphones. Various government initiatives, for instance, ‘Make in India’ by the Indian government and ‘Made in China 2025’ by the Chinese government, support the establishment of manufacturing units in their respective nations.

5. MARKET POTENTIAL AND MARKETING ISSUES:

Though CNC Machines are new technology for India, It is developed since 70s, in advance countries. This machine recently very rapidly replaces the convention engineering machineries. 2D and 3D printing technology added this service for better result. As it is required high skill operation, the CNC programming is in much demand.

6. THE TECHNOLOGY:

There are two types of computer aided design software. 2D design software allows the designer to design shapes with very limited three dimensional properties. Do not underestimate the designs that can be achieved through 2D software. Most CAD/CAM software allows the designer to test the manufacture of his/her design on a computer rather than actually making it. This saves time and materials. Testing designs is carried out using ‘simulation’ software. When the design is run through simulation software the computer displays the manufacturing on the screen. It also checks whether or not the design can be manufactured successfully. Many designs have to be altered before they can be made by a CNC machine. After all the testing and improvements to the design, it can finally be manufactured on a CNC machine. 3D Design software allows the designer to produce three dimensional representations of his/her ideas. When completed the design can be viewed on the screen and it can even be revolved and examined at any angle. 3D software is much more complex than 2D software

such as Tec Soft 2D design. It requires specialist training before it can be used competently.

7. REQUIREMENTS – Material/Equipment and manpower

Resources

CNC Machine, Control panel, Computers with latest OS and Network Infrastructure, Advanced Software like CAD CAM and other software according to the requirement.

8. MANPOWER REQUIREMENT:

Sr. No.	Designation of Employees	Salary Per	Monthly	Year-1	Year-2	Year-3	Year-4	Year-5
1	Software technician	18000	18000	1	1	1	1	1
2	Tech Support	12000	60000	5	5	5	5	5
3	Marketing Support	10000	20000	2	2	2	2	2
4	Quality testing person	15000	15000	1	1	1	1	1
5	Accounts/Stores	12500	25000	2	2	2	2	2
6	Office Boy	9000	40000	2	2	2	2	2
	Total		158000	12	12	12	12	12

9. IMPLEMENTATION SCHEDULE:

The project can be implemented in 3 months' time as detailed below:

Sr. No.	Activity	Time Required
1	Acquisition of premises	1.00
2	Construction (if applicable)	1.00
3	Procurement & installation of Plant & Machinery	1.00

4	Arrangement of Finance	2.00
5	Recruitment of required manpower	1.00
	Total time required *(some activities shall run concurrently)*	3.00

10. COST OF PROJECT:

Sr. No.	Particulars	₹ in Lacs
1	Land	5.00
2	Building	10.00
3	Plant & Machinery	11.00
4	Furniture, Electrical Installations	5.00
5	Other Assets including Preliminary / Pre-operative expenses	1.10
6	Working Capital	12.00
	Total	**44.10**

11. MEANS OF FINANCE:

Bank term loans are assumed @ 75 % of fixed assets. The proposed funding pattern is as under:

Sr. No.	Particulars	₹ in Lacs
1	Promoter’s contribution	11.03
2	Bank Finance	33.08
	Total	**44.10**

12. WORKING CAPITAL CALCULATION:

The project requires working capital of 12.00 lakhs as detailed below:

Sr. No.	Particulars	Gross Amt	Margin %	Margin Amt	Bank Finance
1	Inventories	6.00	0.25	1.50	4.50
2	Receivables	3.00	0.25	0.75	2.25
3	Overheads	3.00	100%	3.00	0.00

4	Creditors	-		0.00	0.00
	Total	12.00		5.25	6.75

13. LIST OF PLANT AND MACHINERIES:

Sr. No.	Particulars	UOM	Qtty	Rate (₹)	Value (₹ in Lacs)
	Plant & Machinery / equipments				
a)	***Main Machinery***				
i.	Cnc Plastic Machine	NOS.	1	700000	7.00
ii.	Software	Nos	5	50000	2.50
iii.	Computer Network	Nos	1	50000	0.50
IV	Installation, erection electrification.			50,000	0.50
V	Taxes and Transportation			50000	0.50
	sub-total Plant & Machinery				**11.00**
	Furniture / Electrical installations				
a)	Office furniture	LS	1	50000	0.50
b)	Stores Almirah	LS	1	0	0.00
c)	Computer & Printer	L. S.	1	50000	4.50
	Sub total				**5.00**
	Other Assets				
A	Preliminary and preoperative				1.10
	sub-total Other Assets				1.10
	Total				**17.10**

All the machines, computer/their peripherals and equipment are available from local manufacturers. The entrepreneur needs to ensure proper selection of product mix and proper type of machines, computers and accessories to have modern and flexible designs. Some of the machinery and computer suppliers are listed here below:

1. Success Technologies
   97, Barcelona Industrial Estate,
   Odhav Ring Road Circle, Odhav,
   Ahmedabad, Gujarat 382415. Phone: 076000 08995

2. Impressive Computers
   Hasan Ali House No. 4/41-A, Noor Baug,
   Umerkhadi, Mumbai - 400009,
   Maharashtra, India

3. Computer Planet
   Shop No. 1, Shaniwar Peth-53, Opposite Amruteshwar Mandir,
   Amruteshwar Co Operative Housing Society,
   Near Shaniwar Wada, Pune – 411030,
   Maharashtra, India

4. AXYZ INTERNATIONAL - “Foreign Supplier”
   5330 South Service Road, Burlington, Ontario, L7L 5L1
   Canada. Tell: +1 800 361 3408, Email: enquiries@axyz.com

5. S. A. Engineering Works
   No. 17/2, Periyasamy Street, Sunambu Kalavai,
   Kuniyamuthur, Coimbatore-641008, Tamil Nadu, India
   Phone: +91-9362233362; +91-9047476299, +91-422-2233362

14. PROFITABILITY CALCULATIONS:

Sr. No.	Particulars	UOM	Year-1	Year-2	Year-3	Year-4	Year-5
1	Capacity Utilization	%	60%	70%	80%	90%	100%
2	Sales	₹. In Lacs	36.00	42.00	48.00	54.00	60.00
3	Raw Materials & Other direct inputs	₹. In Lacs	12.48	14.56	16.64	18.72	20.80
4	Gross Margin	₹. In Lacs	23.52	27.44	31.36	35.28	39.20
5	Overheads except interest	₹. In	6.24	6.63	7.41	7.64	7.80

		Lacs					
6	Interest	₹. In Lacs	3.31	3.31	2.21	1.65	1.32
7	Depreciation	₹. In Lacs	7.70	5.50	3.85	2.75	2.48
8	**Net Profit before tax**	₹. In Lacs	**6.27**	**12.00**	**17.89**	**23.23**	**27.60**

The basis of profitability calculation:
The growth of selling capacity will be increased 10% per year. (This is assumed by various analysis and study; it can be increased according to the selling strategy.)

Energy Costs are considered at Rs 7 per Kwh and fuel cost is considered at Rs. 65 per liter. The depreciation of plant is taken at 10-12 % and Interest costs are taken at 14 -15 % depending on type of industry.

15. BREAK EVEN ANALYSIS:

Sr. No.	Particulars	UOM	Value
1	Sales at full capacity	₹. In Lacs	60.00
2	Variable costs	₹. In Lacs	20.80
3	Fixed costs incl. Interest	₹. In Lacs	9.12
4	BEP = FC/(SR-VC) x 100 =	% of capacity	23.27%

16. STATUTORY / GOVERNMENT APPROVALS

As per the allocation of business rules under the Constitution, labour is in the concurrent list of subjects. It is dealt with by the MOLE at the Central and Departments of Labour under State Governments in respective States / UTs. The

MOLE has enacted workplace safety and health statutes concerning workers in the manufacturing sector, mines, ports and docks and in construction sectors.

Further, other Ministries of the Government of India have also enacted certain statutes relating to safety aspects of substances, equipment, operations etc. Some of the statutes applicable in the manufacturing sector are discussed below:

The Manufacture, Storage and Import of Hazardous Electronic Rules (MSIHC), 1989

These MSIHC Rules are notified under the Environment (Protection) Act, 1986. These rules are aimed at regulating and handling of certain specified hazardous chemicals. The rules stipulate requirements regarding notification of site, identification of major hazards, taking necessary steps to control major accident, notification of major accident, preparation of safety report and on-site emergency plan; prevention and control of major accident, dissemination of information etc. These rules are notified by the Ministry of Environment and Forests (MOEF) but enforced by the Inspectorates of Factories of respective States / UTs in the manufacturing sector. Entrepreneur may contact State Pollution Control Board where ever it is applicable.

17. BACKWARD AND FORWARD INTEGRATIONS

Both forward and backward integration for any Electrical Industry are strategies to gain better control over the supply chain, reduce dependency on the suppliers and increase their competitiveness. The two strategies can help companies reduce their dependency on suppliers and increase their influence over the customers. The benefits of these strategies can be big. Both impact the bottom line directly. Integration happens if a company moves upward or downward in its supply chain. Starting from the suppliers from whom the raw materials are obtained, the chain moves downstream towards the distributors and the retailers. If the suppliers' power is very high, it can create financial burdens for the company. Suppose the number of suppliers of a company is low, then the control in their hands would be low. The burden in that case will fall upon company's shoulders. Its expenditure on raw materials will be high.

18. TRAINING CENTERS AND COURSES

There is no such training required to start this business but, basic Plastic Engineering and IT/Computer Programming related course can be plus point for promoter. Promoter may train their employees in such specialized institutions to grow up the business. There are few specialized Institutes provide degree certification in chemical Technology, few most famous and authenticate Institutions are as follows:

1. Department of Electrical LD College of engineering
   No.120, Circular Road, University Area, Navrangpura,
   Opposite Gujarat University, Ahmedabad, Gujarat 380015

2. MIT College of Engineering, Pune
   Gate.No.140, Raj Baugh Educational Complex,
   Pune Solapur Highway, Loni-Kalbhor, Pune – 412201
   Maharashtra, India

3. Central Institute of Plastics Engineering and Technology
   CIPET Head Office, T.V.K. Industrial Estate,
   Guindy, Chennai - 600 032.
   Phone No.: +91-44-22254780, +91-44-22253040
   Fax No.: +91-44-22254787

Udyamimitra portal (link : www.udyamimitra.in) can also be accessed for handholding services viz. application filling / project report preparation, EDP, financial Training, Skill Development, mentoring etc.

Entrepreneurship program helps to run business successfully is also available from Institutes like Entrepreneurship Development Institute of India (EDII) and its affiliates all over India.

Disclaimer:

Only few machine manufacturers are mentioned in the profile, although many machine manufacturers are available in the market. The addresses given for machinery manufacturers have been taken from reliable sources, to the best of knowledge and contacts. However, no responsibility is admitted, in case any inadvertent error or incorrectness is noticed therein. Further the same have been given by way of information only and do not carry any recommendation.

Source:- Udyami Mitra/Sidbi