DENTAL CROWN, BRIDGE & ALLIED IMPLANTS

1. INTRODUCTION:

Tooth replacement becomes necessary when the tooth and its roots have been irreparably damaged, and the tooth has been lost or must be removed. Dentists have long known that a missing permanent tooth should always be replaced or else the teeth on either side of the space gradually tilt toward the gap, and the teeth in the opposite jaw begin to move toward the space. These dental treatments are essential for better functionality and hygiene in addition to adding aesthetics. Dental products such as dentures, traditional bridges, crowns, etc. improve dental health in addition to providing aesthetics.

2. PRODUCT & ITS APPLICATION:

A full denture is made to restore both the teeth and the underlying bone when all the teeth are missing in an arch. A smaller version is the fixed partial denture, also known as a fixed bridge, which can be used if generally healthy teeth are present adjacent to the space where the tooth or teeth have been lost. The partial denture is anchored to the surrounding teeth by attachment to crowns, or caps, that are affixed to the healthy teeth. A removable partial denture is used to replace multiple missing teeth when there are insufficient natural teeth to support a fixed bridge. This device rests on the soft tissues of the jaws, and is held in place with metal clasps or supports.

Bridges and crowns are fixed prosthetic devices that are cemented onto existing teeth or implants by a orthodontist or periodontist. Crowns are used most

commonly to entirely cover or "cap" a damaged tooth or cover an implant. Bridges are commonly used to cover a space of missing one or more teeth. They are cemented to natural teeth or implants surrounding the space where the tooth once stood.

A dental implant is a titanium post (like a tooth root) that is surgically positioned into the jawbone beneath the gum line that allows dentist to mount replacement teeth or a bridge into that area. An implant doesn't come loose like a denture can. Dental implants also benefit general oral health because they do not have to be anchored to other teeth, like bridges. The basis for modern dental implants is a biologic process called Osseo integration, in which materials such as titanium form an intimate bond to bone. The customer specific product supply units are having good potential as dental hygiene and aesthetics is gaining importance.

3. DESIRED QUALIFICATIONS FOR PROMOTER:

The promoter with dental degree or an entrepreneur with some experience in this business and having training will be able to manage the project well.

4. INDUSTRY OUTLOOK/ TREND:

Dental implants are the latest tooth-replacement technology. They allow prosthetic teeth to be implanted directly in the bones of the jaw. Every individual's mouth is different, and each denture must be custom designed to fit perfectly and to look good.

The latest methodology used in denture design, known as dentogenics, is based on research, which has developed standards for designing teeth to fit specific smile lines, mouth shapes, and personalities. These standards are based on such factors as mouth size and shape, skull size, age, sex, skin color, and hair color. For example, through proper denture design, patients can be given a younger smile by simply making teeth longer than they normally would be at that patient's age. This rejuvenation effect is possible because a person's teeth wear down over time;

slightly increasing the length of the front teeth can create a more youthful appearance.

There is growing awareness in the country for dental health as also the importance of better aesthetics of face, teeth and smile /appearance makeovers among young generation. Besides several unfortunate people have disfigurement either due to accidental damages or defects when born/ growing up. These new technologies help in correcting such teeth irregularities defects or damages. It helps in curing the dental and overall health of patients and improves self-esteem/ confidence through such dental procedures.

The youthful population of country having very low average age and improving affordability has given rise to acceptance of these dental procedures and demand is steadily growing from Metro cities to larger A grade B Grade Cities throughout the country. This augers well for new projects all over India to supply products to practicing Dentists.

5. MARKET POTENTIAL AND MARKETING ISSUES. IF ANY:

There are around more than large no dental clinics, dental colleges and every year with more than 1000 students in undergraduate and in PG classes. This product now deploys new high technology 3D imaging, CAD, CAM to achieve individual demands for dentures/ implants. The miniature products demand high precision casting of advanced materials like Ceramics, titanium, Porcelain etc. After making a survey the promoter can develop ties with existing dental clinics to meet of the requirement of existing establishments to make the unit viable. In view of increasing demand for dental treatments for health hygiene and aesthetics, there is good scope of the units.

Various products are emerging in this dental implants, crowns, bridges as well as dentures field for variety of applications. One must select proper plant product mix

based on experience and expertise and look at popular products to narrow down product selection. This project requires multidisciplinary approach as the entrepreneur will need to develop medical insight in to dental surgical and material advances. There is good margin to be earned by keeping abreast with the research and development in this area.

6. RAW MATERIAL REQUIREMENTS:

Most artificial teeth are made from high quality acrylic resins, ceramics, Zirconium and titanium metals. Frames and abutments are made from metals such as SS and titanium. These materials are proprietary formulations with bio compatibility and suitably stronger and more attractive. Porcelain is used particularly as coating on teeth and different shades of color pigments are used for translucency and natural appearance. Zirconium and other proprietary materials are available as blanks/ discs to produce near natural teeth and gum properties. Metal and plastic mounts/ abutments are also available from dental material suppliers from western countries.

7. MANUFACTURING PROCESS:

The dentists treating the patients normally provide master cast impression to prepare models of denture of patient’s mouth in silicon. New technique uses 3D imaging / x ray to get detailed profile of patients dental/ teeth shape size and positioning.

Master models are produced from moulds or 3D imaging by machines. All the teeth are inspected by surveyor. The abutment teeth should be parallel to each other. Design the master cast with marker.

Wax pattern is made on the master cast with inlay wax. Now wax pattern cast is fixed in the sprue former or casting ring and silica mold is obtained by spraying the mold material on wax. The casting ring is placed in casting furnace. Here the inlay wax is completely burn out and casting mold is prepared.

Cast metal is melted and poured in mold from furnace. After cooling the casting ring is transferred to sand blaster machine where cast product is obtained by cutting it from risers etc. The cast end product is debarred this is then oxidized and opaque material is applied on the surface metal. Now porcelain is mixed with 3 D master to match the shade of the tooth. The porcelain fired in the porcelain furnace. Then it is polished, packed and deliver to the dental clinics.

8. MANPOWER REQUIREMENT:

The unit shall require highly skilled persons. The unit can start from 15 employees initially and increase to 35 or more depending on business volume.

Sr. No.	Type of Employees	Monthly Salary	No of Employees				
			Year 1	Year 2	Year 3	Year 4	Year 5
1	Skilled Operators	25000	6	8	10	12	12
2	Semi-Skilled/ Helpers	8000	6	8	12	16	16
3	Supervisor/ Manager	35000	1	1	2	2	2
4	Accounts/ Marketing	18000	1	2	2	3	3
5	Other Staff	7000	1	2	2	2	2
	TOTAL		15	21	28	35	35

9. IMPLEMENTATION SCHEDULE:

The unit can be implemented within 8 months from the serious initiation of project work. The unit is based on selection of location in good urban/ semi urban area.

Sr. No.	Activities	Time Required in Months
1	Acquisition of Premises	-
2	Construction (if Applicable)	-
3	Procurement and Installation of Plant and Machinery	3
4	Arrangement of Finance	2
5	Manpower Recruitment and start up	1
	Total Time Required (Some Activities run concurrently)	6

10. COST OF PROJECT:

The unit will require total project cost of Rs 132.89 lakhs as shown below:

Sr. No.	Particulars	In Lakhs
1	Land	-
2	Building	-
3	Plant and Machinery	84.10
4	Fixtures and Electrical Installation	10.60
5	Other Assets/ Preliminary and Preoperative Expenses	7.00
6	Margin for working Capital	31.19
	TOTAL PROJECT COST	132.89

11. MEANS OF FINANCE:

The project will require promoter to invest about Rs 61.70 lakhs and seek bank loans of Rs 71.19 lakhs based on 70% loan on fixed assets.

Sr. No.	Particulars	In Lakhs
1	Promoters Contribution	61.70
2	Loan Finance	71.19
	TOTAL :	132.89

12. WORKING CAPITAL REQUIREMENTS:

Working capital requirements are calculated as below:

Sr. No.	Particulars	Gross Amount	Margin %	Margin Amount	Bank Finance
1	Inventories	16.13	40	6.45	9.68
2	receivables	10.88	50	5.44	5.44
3	Overheads	6.40	100	6.40	0.00
4	Creditors	32.25	40	12.90	19.35
	TOTAL	65.66		31.19	34.47

13. LIST OF MACHINERY REQUIRED:

Sr. No.	Particulars	UOM	Quantity	Rate	Total Value
	Main Machines/ Equipment				
1	3D Dental shape position scanner	Nos.	1	850000	850000
2	CAD Center with design Software	Nos.	1	1200000	1200000
3	3D CNC Milling for Crown Bridge etc.	Nos.	1	2000000	2000000
4	Casting machine	Nos.	3	100000	300000
5	Sintering Oven	Nos.	3	150000	450000
6	Deburring/ polishing station	Nos.	3	300000	900000
7	Anodizing treatment for porosity surface preparation	Nos.	2	450000	900000
8	Porcelain application curing and painting	Nos.	3	150000	450000

9	Sterilization plant		1	150000	150000
10	Inspection and Packing station		3	120000	360000
	subtotal :				7560000
1	Tools and Ancillaries				
2	Cutting tools and Holders for CNC Machine	LS	1	250000	250000
Sr. No.	**Particulars**	**UOM**	**Quantity**	**Rate**	**Total Value**
3	Inspection Stations	LS	1	300000	300000
4	Misc Lab machines and Tools	LS	1	300000	300000
	subtotal :				850000
	Fixtures and Elect Installation				
	Mould storage racks	LS	1	300000	300000
	Other Furniture	LS	1	50000	50000
	Telephones/ Computer	LS	2	30000	60000
	Electrical Installation	LS	1	650000	650000
	subtotal :				1060000
	Other Assets/ Preliminary and Preoperative Expenses	LS	1	700000	700000
	TOTAL PLANT MACHINERY COST				10170000

All the machines and equipments are available from India except the latest 3D design and CAD/ CAM systems which are sourced from Europe, US and Japanese manufacturers. The entrepreneur needs to ensure proper selection of equipments / systems supplier for product system, tooling etc. Mostly these are recommended by main 3D system suppliers. The facilities and the techniques are also focused on the materials to be used for the product mix. It may be worthwhile to look at several options based on experience or opinions of practicing dentists. Some of the machinery and dies and toolings suppliers are listed here below:

1. MTAB Engineers (P) Ltd.
   107, Developed Plots, Electrical And Electronics Industrial Estate,
   Perungudi, Chennai-600096, Tamil Nadu, India

2. Apsom Infotex Limited
New Number 10, Old Number 14, Kammalar Street Thousand Lights East Thousand Lights
Chennai 600006 Tamil Nadu, India

3. Quadrant Dental Solution
A-1, Satyam Complex M.G.Road ,Ghatkopar East,
Mumbai-400075, Maharashtra, India

4. Smile Studio
No. 8, Kutchhi House, Brahmanwada Road,
Mumbai-400019, Maharashtra, India

14. PROFITABILITY CALCULATIONS:

Sr. No.	Particulars	UOM	Year Wise estimates				
			Year 1	Year 2	Year 3	Year 4	Year 5
1.	Sales	Rs Lakhs	261.00	348.00	435.00	522.00	609.00
2.	Raw Materials & Other Direct Inputs	Rs Lakhs	193.52	258.02	322.53	387.04	451.54
3.	Gross Margin	Rs Lakhs	67.48	89.98	112.47	134.96	157.46
4.	Overheads Except Interest	Rs Lakhs	29.8	29.87	29.87	29.87	29.87
5.	Interest	Rs Lakhs	8.54	8.54	8.54	8.54	8.54
6.	Depreciation	Rs Lakhs	10.17	10.17	10.17	10.17	10.17
7.	Net Profit Before Tax	Rs Lakhs	18.90	41.39	63.88	86.38	108.87

The basis of profitability calculation:

The Unit will have capacity of offer up to 5000 customer products per year from dentists and surgeons. The prices / treatment costs are ranging from Rs. 500 to Rs 30000 per teeth depending on type of treatment and materials chosen viz zircon, porcelain, acrylic or metals.

The crown/ bridge cast material costs ranges from Rs 150 to 800 per 100gm for acrylic/ PMMA, while metal / Nickle alloy blanks costs Rs 1500 to Rs 2200 per milling blank while ceramic and porcelains for milling blanks costs Rs 2500 to Rs 8000 per blank. Also there are 3D printer materials available. About 30 to 50 nos of teeth equivalent crowns and bridges can be achieved per blank. Other consumables are taken at prevailing market rates. Wastage/ scrap is taken at 12% which normally does not have any value except salvage in some case. Consumables costs also considered based on prevailing rate.

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

15. BREAK EVEN ANALYSIS

The project is can reach break-even capacity at 21.60 % of the installed capacity as depicted here below:

Sr. No.	Particulars	UOM	Value
1	Sales at Full Capacity	Rs Lakhs	870.00
2	Variable Costs	Rs Lakhs	645.06
3	Fixed Cost incl. Interest	Rs Lakhs	48.59
4	Break Even Capacity	% of Inst Capacity	21.60

16. STATUTORY/ GOVERNMENT APPROVALS

The unit may obtain industry unit registration from District Industry center. Shops in city areas shall need to get shop and establishment registration from local municipality etc. no other procedures are involved. Before starting the unit will also need GST registration for procurement of spares etc materials as also for sale of goods and services. As such there is no pollution control registration requirements, however the unit will have to ensure safe environment and Solid waste disposal shall have to meet the required norms. Entrepreneur may contact State Pollution Control Board where ever it is applicable.

17. BACKWARD AND FORWARD INTEGRATION

The machines and equipment offer little scope for diversification. As such there is not much scope for organic backward or forward integration.

The dental labs supplying products needs to build up rapport with practicing dentists and surgeons and build up reputation, ensure reliability and quality of services rendered. Also personal rapport of key persons can generate good business volumes from hospitals. The location with good catchment area ensures good market potential to new business units.

18. TRAINING CENTERS/COURSES

There are no specific training centers for production technology. Most of the training is given by system and equipment/ material suppliers or through apprentice ship with reputed dental labs.

Udyamimitra portal (link: www.udyamimitra.in) can also be accessed for hand-holding 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