Study of the Need Analysis to Establish a Stand Alone Diagnostic Center

A dissertation submitted in partial fulfillment of the requirements

for the award of

Post-Graduate Diploma in Health and Hospital Management

by

Sachin Suresh Shinde

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Thank You

Sachin Suresh Shinde

PGDHHM

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Abbreviations

1.	CAP	College of American Pathologist
2.	CBCT	Cone Beam Computed Tomography
3.	CEO	Chief Executive Officer
4.	CSR	Corporate Social Responsibility
5.	CT	Computed Tomography
6.	DLC	Differential Leucocytes Count
7.	ECG	Electro Cardiogram
8.	ESR	Erythrocyte Sedimentation Rate
9.	Hb	Hemoglobin
10.	HIV	Human Immunodeficiency Virus
11.	ISO	International Organization for Standardization
12.	LEED	Leadership in Energy & Environmental Design
13.	LDL	Low Density Lipoproteins
14.	MRI	Magnetic Resonance Imaging
15.	NABL	National Accreditation Board for Testing and Calibration Laboratories
16.	NFHS	National Family Health Survey
17.	OPG	Orthopantomogram
18.	PACS	Picture Archival & Communication System
19.	PET	Positron Emission Tomography
20.	ROI	Return On Investment
21.	SGOT	Serum Glutamic Oxaloacetic Transaminase
22.	SGPT	Serum Glutamic Pyruvic Transaminase
23.	TMT	Tandem Mass Tag
24.	TPA	Third Party Administrator
25.	USG	Ultrasonography
26.	VDRL	Venereal Disease Research Laboratory
27.	VLDL	Very Low Density Lipoproteins

Part I

Internship Report

1. Organizational Overview

Health Sprint

Vision: - we aim to connect healthcare ecosystem and its key players using web based technologies to enable valuable use scenarios, which bring value to our customers, investors and to the community we live in. Enabling **GREEN** payer provider network by transforming paper based workflows in to **INTERNET ENABLED WORKFLOWS**

Mission: - Enabling web based information exchange platform, which enables reliable, speedy and transparent payer- provider workflow.

Company Background

- HealthSprint Networks is a Healthcare IT Services company, founded in May 2006 by 3 promoters who possessed desired and complementary skills from healthcare, technology and marketing domains.
- HealthSprint has formulated clear business programs in healthcare and implemented one revenue generating use scenario “web enabled in-patient insurance claims management network”. This is one specific instantiation of company’s larger program of ‘payer- provider network”
- HealthSprint has growing customer base of providers, such as Fortis, Manipal and payers such as TTK, Mediassist, ICICI Lombard
- HealthSprint has growing employee strength, who comes from healthcare, technical and business arena.
- HealthSprint believes in enabling green payer provider network by transforming paper based workflows in to internet enabled workflows.
-

Key Business Use Scenarios, Problems and needs

In-Patient Insurance Claims Information Exchange Network

- How to exchange relevant information between payer and provider in real time easily & securely?
- How to manage payment risks for hospitals, TPA’s and insurers?
- Pre-Policy Insurance Information Exchange Platform
- How to exchange information timely and seamlessly between insurance company, diagnostic centers, customers?
- How to reduce policy issue/customer capture time?
- B2C Search and Scheduling Engine
- Need for cost effective information exchange &communication platform enabling desired workflow with ease.
- Need for transparent, reliable, secure and real-time communication platform.
- Creation of network of relevant healthcare players/entities such as Hospitals, TPA’s, Insurers Patients.
- Need for cost effective business models, which remove entry barriers and enable players to make their operations more effective.

Issues in cashless payer provider interaction

- Delay in Authorizations – dissatisfied Insured patient
- Communication issues – Insured/Claimant not kept in the loop regarding status of request
- Delay in submission of claims affecting Payer and Provider relationships.....missing documents, documents lost in transit
- Tracking of claims by providers on status
- Reconciliation of payments – Manual , time consuming

Obstacles and challenges

- Trained Manpower – Health Insurance processes and IT platform
- ICD 10 coding adoption at Provider end

- Internet Bandwidth as claim submission will require very large files in smaller hospitals and tier 2 cities

- Partnering with Institutes like IIHMR , ICRI and Med varsity to conduct short term courses on Health Insurance Claims Management including ICD 10 coding and documentation
- Need help of Insurance cos. /TPA's to participate and promote short term courses.
- Education of Indian IT act laws process and enforcement in agreements in the ecosystem
- First move by Govt. of India (MOH) to adopt paperless transaction will motivate Insurance companies/TPA's to adopt

6. Learning

- Insurance is a rapidly growing sector, it is growing at the rate of more than 40% annually.
- The bulk of the corporate hospital revenue is generated through insurance and cashless facility.
- The disallowance and loss in collecting insurance claims is more than 8% in present hospital setting.
- Delay in insurance claim settlement is more than 45 days to 3 months in some of the hospitals.
- The turnaround time for preauthorization is 4-48hrs.
- The turnaround time for final approval or enhancement is 2-12 hrs.
- Rejection or denial of cashless request from TPA is around 3-8%
- This disallowance cannot be completely removed from the system but what can be done is some measures to minimize such heavy loses beard by the providers.
- Over the years Healthsprint has been able to reduce such disallowances to a bare minimum and also turnaround time has been reduced to a greater extent with the help of i-sprint online platform.

PART II

DISSERTATION REPORT

Study of the Need Analysis to Establish a Stand Alone Diagnostic Center

Abstract

This project was done at Health Sprint Network Ltd. during a period of 3 months i.e 10 Jan, 2012 to 31 March,2012. The main objective of the project was to conduct a prefeasibility study and formulate the facility mix for a standalone diagnostic centre and to understand important factors influencing patient behaviors in selection of diagnostic centre, which in future can be used as an important marketing tool. The idea here was to understand the existing market condition and then analyze the need gap of the services and most importantly the location analysis for the new setup.

A comprehensive health care market survey was conducted. The prime target segments, i.e., the various leading Diagnostic centers in Thane were chosen in accordance with the project during the duration allotted. The methodology used to carry out this project was retrospective and prospective study. The survey revealed the following:

i. The market for diagnostics has been well tapped with over 100 diagnostic centres present in Thane. Most of the leading chain diagnostics have their setup in Thane like Birla diagnostic Centre, Jupiter Scan Centre etc.

ii. Mumbai has more advanced standalone imaging centres than Thane. The trend followed by most pathology labs in Thane is to outsource the special test to the leading chain diagnostic centres.

iii. From the market survey it's clear that the patients paying capacity is very high and they are willing to spend it for better quality results. 98% of them are paying from their pockets as the insurance companies do not cover the expenses of the diagnostic services unless it results in the diagnosis of an ailment.

iv. Sharp rise in demand of preventive health checkups, age related check up's, pre-employment and pre-insurance checkups etc in the diagnostic centres, due to increase in health awareness and increasing multinational companies in Thane.

The Healthcare market growth drivers in Thane are:

i. An exponentially increasing population because of urbanisation of peripheral areas and migration of people. There was a 35 % decadal growth of population according to the census 2011[1].

ii. Around 20% of the patients, visiting the hospitals for their health care needs belong to the adjacent areas of Thane.

iii. Increasing health awareness, paying capacity and insurance penetration of the population.

---

1. **Introduction**

Radiology is one of the most important of the scientific and therapeutic facilities in the field of health care. Radiology is the branch of medicine which deals with the agnostic and therapeutic application of radium energy. This department is under supervision of qualified Radiologist. This is one of the areas where the spread of technology is most rapid. Any fore casting is very difficult. It is certain that major advances which are unimaginable today will appear in the next 10 years and will soon spread rapidly.

In times of illness and several diseases, the clinical signs & symptoms are often not enough to detect the diagnosis and therefore accurate treatments cannot be initiated. Correct diagnosis of the disease through various tests and examinations is very essential.

1.1 Problem Statement

Is the lab only for the patients? Shouldn't labs also cater to the healthy by means of specialized preventive care centers, after all Prevention is better than cure!

There was a time, when the world's most devastating diseases occurred because of infections from various pathogens. As modern science progressed, we have conquered most of the diseases through antibiotics, with vaccinations, inoculations etc. However, new sets of equally dangerous diseases are now threatening us. Ironically these diseases are a byproduct of our affluent lifestyles, but are easily preventable. Irresponsible dietary habits, perpetual stress, smoking, excessive alcohol consumption and irregular working hours all contribute towards these diseases. There is a need to detect these diseases early and also in an effective manner resulting in the proper diagnosis of disease. But these disease are not diagnosed well due to many problems like in some places it is not available & in some places it is not well managed & also there is less availability of space. Moreover, not all the tests are available in a one particular diagnostic center. Because of this, the patient has to move from places to places to get all the tests done.

1.2 Rationale of the study

1,2.1 Few Facts

- One out of every 4 people in India is a Diabetic.

- In another 20 years, India will have the largest population of diabetics in the world.
- In urban India, one out of every 4 adults has Hypertension or high blood pressure.
- Diabetics and hypertensive's account for 2/3rd of the total cases of Kidney Failure.
- 10 million new cases of Cancer are reported every year and over 6 million people die of cancer every year.
- One in 30 women in the age group of 20-74 years has Breast Cancer.
- Over 30% women above the age of 50 years are likely to develop Osteoporosis.

In order to control the progress of these diseases something needs to be done – A full 25% reduction in mortality is possible in India via primary prevention.[2]

Most of the diseases are "silent", i.e. you often do not have any early symptoms. Therefore, regular screening tests are the only way for early detection. Hence there is a huge demand and supply gap.

So this arises the need for a diagnostic centre which focuses on preventive health checkups. These are the new generation combined setups which have an array of facilities which can be practiced by a licensed practitioner.

2 **Scope**

The study is to understand the current market scenario of diagnostic centers in the Thane and the reasons for patients choosing to use these facilities. The study thus provides information on the various services and prices of the services that are available, and also the preferences made by the patients in choosing the clinic and service.

3 **Literature Review**

A diagnostic centre is a place whose primary purpose is to provide complete diagnostic services like pathological, radiological and special tests. It is one roof under which all the medical tests are carried out.

3.1 Services Offered

Pathological Lab services

- Clinical Biochemistry
- Clinical Pathology
- Cytopathology
- Haematology
- Histopathology
- Immunology

A complete list of tests is given in the annexure below.

Radiological services

- Digital cardiac Cath Labs with Stent Boost (software visualization tools) – angiography, angioplasty
- CT Machine (2-256 slices)
- Intelligent Ultrasound/Echo Technology
- MRI Machine (0.3-3.0 Tesla)
- Whole Body Imaging with contrast
- 1000 mA Digital X-ray
- OPG (300 – 500 mA)
- Endoscopy
- Bone densitometry
- 4 D Colour Doppler
- Echo cardiographs
- Mammography
- Nuclear imaging Dual head gamma camera, PET Scan

3.2 Schemes and packages

- General Health Check Profile : It includes the following investigations – X-Ray chest PA view; ECG, Blood tests such as Hb, TLC, DLC, Blood sugar fasting &

PP, blood urea nitrogen, serum creatinine, blood cholesterol and urine routine examination.

- Executive check Profile : It includes the following –ECG; X-Ray chest PA view; Ultra-sound scan of abdomen; Blood tests such as – Hb, TLC, DLC, ESR, Blood sugar fasting & PP, Blood Urea nitrogen, serum Creatinine, Liver function tests (Bilirubin, proteins, SGOT, SGPT, Alkaline Phosphates), Lipid profile (Total Cholesterol, HDL Cholesterol, Triglycerides, LDL, VLDL), Uric acid and urine routine examination.
- Executive check – Heart Profile: All tests in No. 2 above with TMT and echocardiography.
- Executive health check Profile - Females (above 30yrs): All tests in No.2 above with mammography, Breast ultrasound and pap smear examination.
- Heart check profile: ECG, X-ray Chest PA view, Blood sugar F & PP, Lipid profile, Uric acid, Blood urea, Urine R/E, TMT, Echocardiography.
- Healthy Bride Panel: Blood group, VDRL, HbsAg, HIV, Hb Variants
- Healthy Bride groom Panel: Blood group, VDRL, HbsAg, HIV, Hb Variants.

3.3 <u>Corporate Health Care</u>

- Pre-Employment Health Screening
- Employee Annual Health Checkups
- Drug-Abuse Screening
- Corporate Social Responsibility(CSR)/Compliance
- Food Handlers checkups
- First Aid trainings to employees and security personnel assistance

3.4 Organ specific program

- Obesity control program
- Diabetes control program
- Spirometry for lungs
- Audiometry for hearing

- Stress test and ECG for heart function
- Ophthalmic check ups

3.5 The Clinic can conduct the following programs for your organization:

- Onsite Wellness
- Health Checks – Executive, Pre-employment etc.
- Stress Management Workshops
- Vaccinations
- Antenatal classes
- Monthly Specialists Talk on various issues like:
  - First Aid
  - Young Women Health
  - Stress Management
  - Cardiac Diabetic
  - Dentistry / Oral Health Care
  - Ophthalmic Care

3.6 <u>Emergency medical assistance</u>

1. Home / office visits
2. Pre Insurance health check up
3. Preventive health check up

3.7 <u>Advantage of Stand alone Diagnostic Center over the ones attached to the hospitals</u>

These centers can have tie up with many hospitals hence not limited to one hospitals for the patients.

- Will have a variety of patients and will have many walk in clients as people don't prefer to go to hospitals for conducting tests alone.
- The profit earned will be much higher in standalone centres.
- Stand alone diagnostic centre will be specialized for diagnosis hence better service and quality of results are provided.
- People who just want a preventive check up hesitate in going to hospitals they will prefer these centres for their preventive packages.

3.8 Changes with time

1. **Preventive health packages**: earlier only sick people were getting test done but with the change in the lifestyle and technology today there are a set of test that are conducted according to their age of the person which are advised to healthy people to assess their physical status or even diagnose an ailment in its initial stages. Or simply to warn a person of some of the future risks he/she is likely to have.
2. **Client/Patients comfort**: is the priority in today's market for the same many enhancements are talking place for e.g. - office collection of samples, delivery of the reports home, online delivery of the reports, financial assistance programs, tie up with insurance companies/hospitals for cash less facilities, life style planner, emergency medical assistance, mobile imaging for bed ridden patients, better ambience for patients comfort.
3. **Going paper less**: this is the latest trend in health care industry to go paper less by using high end information technology like PACS for imaging, mobile app in I-phone and android phones for viewing the digital images anytime anywhere. The patients are given I cards which will have a chip that will contain all the old information about that person.

4. **Market Overview**

4.1 Geographic profile of Maharashtra

Maharashtra is the third largest state in India both in terms of area as well as population. The State is bounded by the Arabian Sea in the West, Gujarat in the North-West, Madhya Pradesh in the North and the East, Andhra Pradesh in the South-East, and Karnataka and Goa in the South.

4.2 Demographic profile of Maharashtra

Maharashtra has population density of 314 per sq. km. (as against the National average of 312). The decadal growth rate of population of Maharashtra is 22.7% (against 21.5% for the country).

Of Maharashtra's total population of 96.88 million, 58% reside in the rural areas. The Sex Ratio for the State is 922 which is lower than the all-India average of 933. The Sex Ratio for Rural Maharashtra is 960. This is significantly higher than the corresponding figure for Urban Maharashtra (i.e., 873). The Child Sex Ratio for the State stands at 913 which again is considerably lower than the all-India average of 927.

The proportion of Scheduled Caste (SC) population in Maharashtra is 10% and that of Scheduled Tribe (ST) population is 9%. The Sex Ratio for SCs stands at 952 while that for STs is 973.

The overall literacy rate for the State of Maharashtra is 77%. The male literacy rate is 86% which is significantly higher than the female literacy rate (i.e., 67%).

The table below shows Districts wise Population & Population Density in Maharashtra.

Table 1 Districts wise Population & Population Density in Maharashtra

State/District	**Total population**			**Growth Rate (Total Population in %) 2001-2011**
	Persons	Male	Female	
Maharashtra	**112372972**	**58361397**	**54011575**	**15.99**
Mumbai	3145966	1711650	1434316	-5.75
Pune	9426959	4936362	4490597	30.34
Thane	11054131	5879387	5174744	35.94
Nashik	6109052	3164261	2944791	22.33
Solapur	4315527	2233778	2081749	12.10

Source: Census of India 2011

Table 2 Basic trends/Demography indicators of Maharashtra

S.No	Index	2011	2001
1	Population	**112372972**	**9,68,78,627**
2	Population increase (Previous decade in %)	15.99%	22.73%
3	Density (Population/ Sq. Km.)	**365**	315
4	Sex Ratio	925	922
5	Literacy Rate (%)	82.9%	77.27%
6	Crude Birth Rate	17.9(srs2008)	23.4 (SRS 2007)
7	Crude Death Rate	6.6	6.6 (SRS 2007)
8	Total Fertility Rate (NFHS-3)	33	2.7
9	Infant Mortality Rate	33	55 (SRS 2007)

4.3 Health profile of Maharashtra

The figures for major health indicators for Maharashtra are significantly better than the all-India figures. The Total Fertility Rate of the State (according to SRS 2008) is 2.0 which is considerably lower than the National average of 2.6. The Infant Mortality Rate is 33 (according to SRS 2008) which is lower than the National average of 53. The Maternal Mortality Ratio is 130 (according to SRS 2004-2006) which is also lower than the National average of 254. Crude Birth Rate (17.9) and Crude Death Rate (6.6) are lower than the corresponding National average figures of 22.8 and 7.4 respectively (according to SRS 2008).

Table 3 Health Indicators of Maharashtra

Item	Value
Total Fertility Rate (SRS 2008)	2.0
Infant Mortality Rate (SRS 2008)	33.0
Maternal Mortality Ratio (SRS 2004-2006)	130
Crude Birth Rate (SRS 2008)	17.9
Crude Death Rate (SRS 2008)	6.6

4.4 Economic profile of Maharashtra

The proportion of BPL persons in Maharashtra stands at 30.7% as compared to the all-India proportion of 27.5% (according to the estimates of 2004-05). The proportion for Rural Maharashtra stands at 29.6% which is lower than the corresponding figure for Urban Maharashtra (i.e., 32.2%).

The Work Participation Rate for Maharashtra stands at 42%. The proportion of Non-Workers stands at 58%. Among the workers, the vast majority belongs to the category of Other Workers (42%) followed by Cultivators (29%).

Table 4 Economic Indicators of Maharashtra

Item	Value
Poverty (% of BPL persons) – Overall	30.7
Poverty (% of BPL persons) – Rural	29.6
Poverty (% of BPL persons) – Urban	32.2
Work Participation Rate (%)	42.0
% of Non-Workers	58.0
Proportion of Cultivators (%)	29.0
Proportion of Agricultural Labourers (%)	26.0
Proportion of Household Industry Workers (%)	3.0
Proportion of Other Workers (%)	42.0

Table 5 Health & Socio-economic Indicators of Maharashtra State in comparison with India

S. No.	Item	Maharashtra	India
1	Total population (in millions)	1123.00	1210.00
2	Decadal Growth (%)	15.99	17.64
3	Crude Birth Rate	17.9(srs2008)	22.8
4	Crude Death Rate	6.6	7.4
5	Total Fertility Rate	2.0	2.62
6	Infant Mortality Rate	33	53
7	Maternal Mortality Ratio (SRS 2004 - 2006)	130	254
8	Sex Ratio	922	933
12	Literacy Rate	82.9%	74%
13	Female Literacy Rate (%)	75.48	65.46%
14	Male Literacy Rate (%)	89.82	82.14%

4.5 Rural Local Governance in Maharashtra

Table 4 below gives the number of Panchayats and reserved category-wise proportion of elected representatives at all levels and at Gram (Village) level. The proportion of SC candidates is more than 20% at the overall as well as the Gram Panchayat level. The proportion of women is just above 33.3% reservation as mandated by the 73rd Constitutional Amendment Act. All the figures are as of 31st March 2008 and are therefore not latest for Maharashtra.

Table 6 No. of Panchayats and Elected Representatives in Maharashtra

Panchayats	No. of Panchayats	Proportion of Elected Representatives (in %)		
		SC	**ST**	**Women**
At all levels	28,227	11.0	12.0	33.3
At Village level	27,893	11.0	12.0	33.3

Maharashtra is the only State in India where all the Panchayats do not go to polls at one go. Around 20% of the Panchayats go to polls at any given time. Another unique aspect of

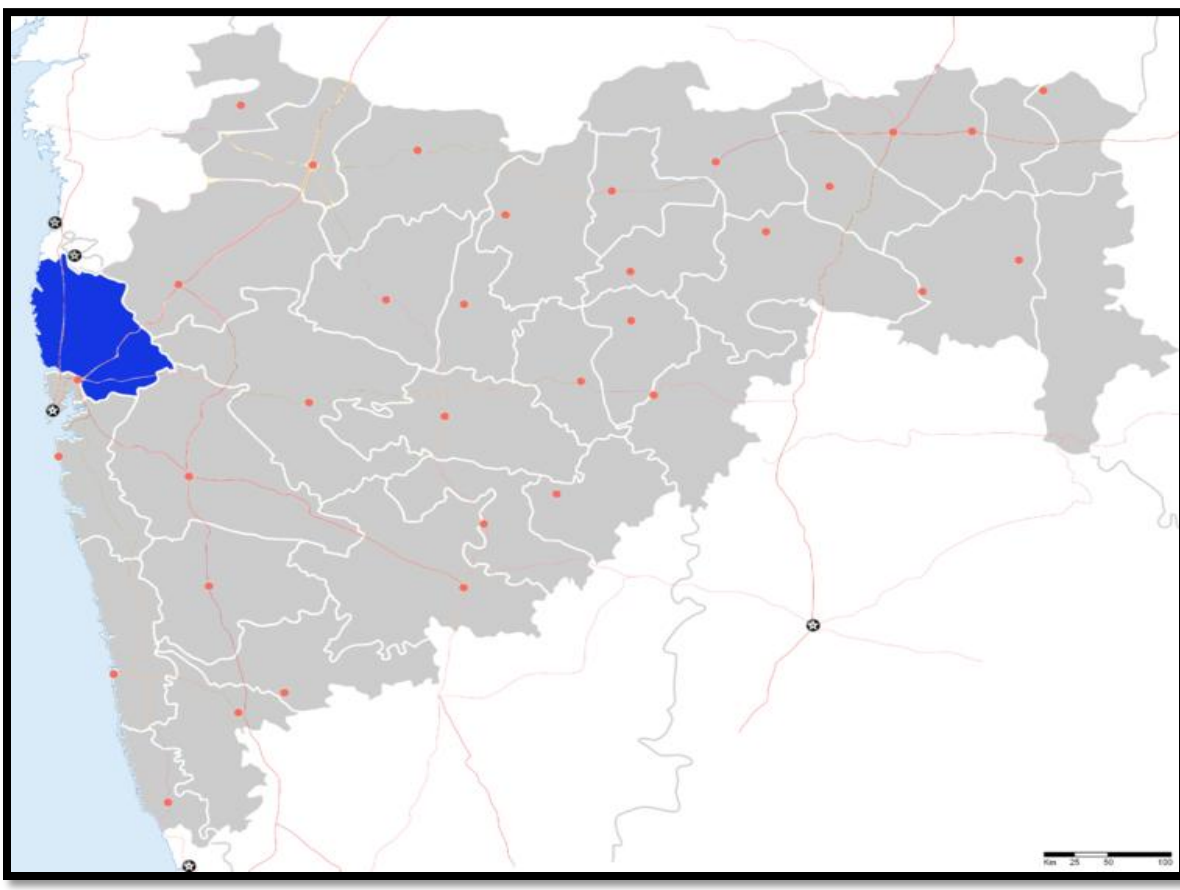
Panchayats in Maharashtra is ‘Women’s Gram Sabha’. These Gram Sabhas are held prior to the general Gram Sabhas. The issues raised by the Women’s Gram Sabha have to be ratified by the general Gram Sabha.

4.6 Thane

Thane is a district in northern Maharashtra state in western India. As of 2011 it is the most populated district in the nation. The headquarters of the district is the city of Thane. Other major cities in the district are Navi Mumbai, Kalyan-Dombivli, Mira-Bhayander, Bhiwandi, Ulhasnagar, Ambarnath, Kulgaon-Badlapur, Dahanu, Shahapur, Wada and Vasai-Virar. This is the third-most industrialised district in Maharashtra.

The area of the district is 9558 km². The shape of the district is triangular. The district is bounded by Pune and Ahmadnagar on the east, Nashik on the east and northeast, Valsad District of Gujarat state and Union Territory of Dadra and Nagar Haveli on the north. The Arabian Sea forms the western boundary, while it is bounded by Mumbai City District and Mumbai Suburban District on the southwest and Raigad District on the south.

4.6.1 Primary Service Area



4.6.2 Boundries

Valsad district, gujrat		**Dadra and Nagar Haveli District,**		**Nashik district,**
		↑		
Arabian Sea	←	**Thane Dictrict**	→	**Ahmadnagar district**
		↓		
Mumbai Suburban district		**Raigad District**		**Pune district**

4.6.3 Administrative Setup

Table 7 Administrative Structure

Structure	**Details**
Division	Konkan
Sub Divisions	Thane
Tehsils (15)	1. Thane, 2. Kalyan, 3. Ambernath, 4. Ulhasnagar, 5. Murbad, 6. Vasai, 7. Bhiwandi, 8. Shahapur, 9. Palghar, 10. Vada, 11. Mokhada, 12. Dahanu, 13. Talasari, 14. Jawhar, 15. Vikramgad
Number of PHCs	78(Tribal-51 & Non Tribal-27)
Number of Sub-Centers	492(346+146)

Source: Govt of MH-Public health Dept

Panchayati Raj Institution: 3 Tier Setup
Total Villages : 1748
Village Level : Gram Panchayat
Block Level : Panchayat Samiti
District Level : Zila Parishad

Table 8 Identifying information

Parameter	Details
Name of District	Thane
No. of Tehsils in the District	15
No. of Panchayat samiti in the District	13
No. of Villages	**1748**
Villages without motorable roads	None (District Well connected by roads)
Villages without electricity	None (District has all electrified villages)

Source: Census

4.7. Geography

The district is the northernmost part of the Konkan lowlands of Maharashtra. It comprises the wide amphitheatre like Ulhas basin on the south and hilly Vaitama valley on the north together with plateaus and the slopes of Sahyadri. From the steep slopes of the Sahyadri in the east, the land falls through a succession of plateaus in the north and centre of the district to the Ulhas valley in the south. These lowlands are separated from the coast by a fairly well-defined narrow ridge of hills that runs north-south to the east of the Thane creek, parallel to the sea keeping a distance of about 6 to 10 km from the shores. A number of isolated hills and spurs also dot the entire district area.

Location : North east of Mumbai on the western coast of India.

Best time to visit : October to March **Languages** : Marathi

Typical coastal sultry & not very hot

Rainfall : Average 250 to 300 m.m.begining of June to end of September.

Temperature : Average 32 - 37' C to 34 - 57'C.

Humidity : 45% to 87% highest in month of August.

4.8 Historical background

In 1817, the territory now comprising Thane district was taken over by the British from the Peshwa and it became a part of North Konkan district, with its headquarters in Thana. Since then, it has undergone considerable changes in its boundaries. In 1830, the North Konkan district was expanded by adding parts of South Konkan district and in 1833 was renamed Thana District. In 1853, the three sub-divisions of Pen, Roha and Mahad together with Underi and Revadanda agencies of Kolaba were formed into the sub-collectorate of Kolaba, under Thana, and ultimately were separated to become an independent Kolaba district in 1869 (presently known as Raigad district).

Back in 1866, the administrative sub-divisions of Thana were reorganised and renamed: Sanjan as Dahanu, Kolvan as Shahapur and Nasrapur as Karjat. Vada petha was upgraded to the level of a taluka. Uran Mahal was separated from Salsette in 1861 and was placed under Panvel. Panvel, together with its mahals of Uran and Karanja, was transferred to Kolaba district in 1883 and Karjat was transferred in 1891. A new mahal with Bandra as headquarters was created in 1917 and in 1920 Salsette was divided into two talukas — north Salsette and South Salsette. South Salsette consisting of 84 villages was separated from Thana District and included in the newly created Bombay Suburban district (present Mumbai Suburban district). North Salsette was made a mahal under Kalyan taluka in 1923 and renamed as Thana in 1926. Kelve-Mahim was renamed as Palghar. 33 villages of the Bombay Suburban district were transferred to Thana district in 1945 and 14 of them were re-transferred to the Bombay Suburban district in 1946 when the Aarey Milk Colony was constituted.

After Independence, in 1949, the princely state of Jawhar was merged with Thana district and became a separate taluka. As many as twenty-seven villages and eight towns from Borivali taluka and one town and one village from Thana taluka were transferred to the Bombay Suburban district in 1956 when the limits of Greater Bombay were extended northwards in Salsette. In 1960, following the bifurcation of the bilingual Bombay State, 47 villages, and three towns in the taluka of Umbargaon were transferred to Surat district in Gujarat and its remaining twenty-seven villages were first included in Dahanu and later in 1961 made into a separate mahal, Talasari.

4.9 Demographic profile

According to the 2011 census Thane district has a population of 11,054,131,[1] roughly equal to the nation of Cuba[8] or the US state of Ohio.[9] This gives it a ranking of 1st in India (out of a total of 640) and 1st in its state.[1] The district has a population density of 1,157 inhabitants per square kilometre (3,000 /sq mi) .[1] Its population growth rate over the decade 2001-2011 was 35.94 %.[1] It has a sex ratio of 880 females for every 1000 males,[1] and a literacy rate of 86.18 %.

It had a population of 8,131,849 of which 72.58% were urban as of 2001. Total literacy rate of the district is 80.67% (male 87.06% and female 73.10%). The population of Thane district in 2011 had risen to 11,054,131; this is close to 10 percent (9.84) of Maharashtra's estimated population of 112.4 million and 1% of India's Total population.[11] The most populated district in the country, somewhat ahead of North 24 Parganas district in West Bengal which had 10,082,852 people.[12] The density of population was estimated at 1,157 people per square kilometer. The sex ratio i.e. number of females per 1000 male was 880 which is less than the states average of 925 and the national average of 940.[13]

The southern talukas are the mostly urban areas and hence along with Marathi many other languages like Sindhi, Gujarati and Hindi are spoken. Marathi is the main language in the rural talukas.

Western coastal region is mostly populated by Kolis, the northern and the eastern talukas are populated by the Varlis, known for making stark images from red mud on house walls.

Table 9 Distribution of Population, Decadal Growth Rate & Population Density

State/District	Population 2011			Percentage decadal growth rate of population		Sex- Ratio (Number of Females per 1000 Males)		Population density per sq. km.	
	Persons	Males	Females	1991-01	2001-11	2001	2011	2001	2011
Thane	11054131	5879387	5174744	54.92	35.94	858	880	851	1157

Table 10 Area, Population and Sex-Ratio of Thane

	Area in Sq.Km	Literates			Sex Ratio
		Total %	Male %	Female %	
Thane	147	86.18	90.90	80.78	880

4.10 Disease profile

Due to its proximity to Mumbai, presence of industries, and large scale construction work going on, the level of pollution in Thane is ever increasing. The amount of dust particles present in the air of Thane has kept pollution on the rise and given birth to air borne allergies in adults and children. Rhinitis, COPD (Chronic Obstructive Pulmonary Disease), asthma, bronchitis, etc are common diseases affecting the general population of Thane, especially children.

The many office complexes in Thane indicate that there are many working people in the district. The increasing working hours and lack of proper food are leading to stress and health problems like back pain and obesity.

Thane residents can choose from a variety of healthcare facilities as the most modern facilities are now available in large corporate hospitals like Hiranandani Hospital, Jupiter Hospital, Shree Sai Hospital, Param Hospital, Fortis Hospital. These hospitals have made Thane the hub of medical tourism in India. In addition, Thane also has several private nursing homes, the district-level Civil Hospital and several dispensaries run by ESI, ECHS and in partnership with various NGOs.

4.11 Socio-Economic Profile:

According to the 2001 Census, the total working population in the district was 11,961,704 persons, which is 47.37% of the total population of the district. Out of total working force, 51.75% were engaged in agriculture and allied activities, 6.19% in manufacturing, service and cottage industries and remaining 30.69% in other activities. Out of total working force, the female working force was 22.89% in the district.

4.12 Health Infrastructure

Healthcare facilities in Thane are in abundance. There are a plethora of diagnostic and wellness centers and the most modern facilities are now available in large corporate hospitals like Hiranandani Hospital, Jupiter Hospital, Shree Sai Hospital, Param Hospital, Fortis Hospital.

In addition, Thane also has several private nursing homes, the district-level Civil Hospital and several dispensaries run by ESI, ECHS and in partnership with various NGOs.

4.13 Project Site Map

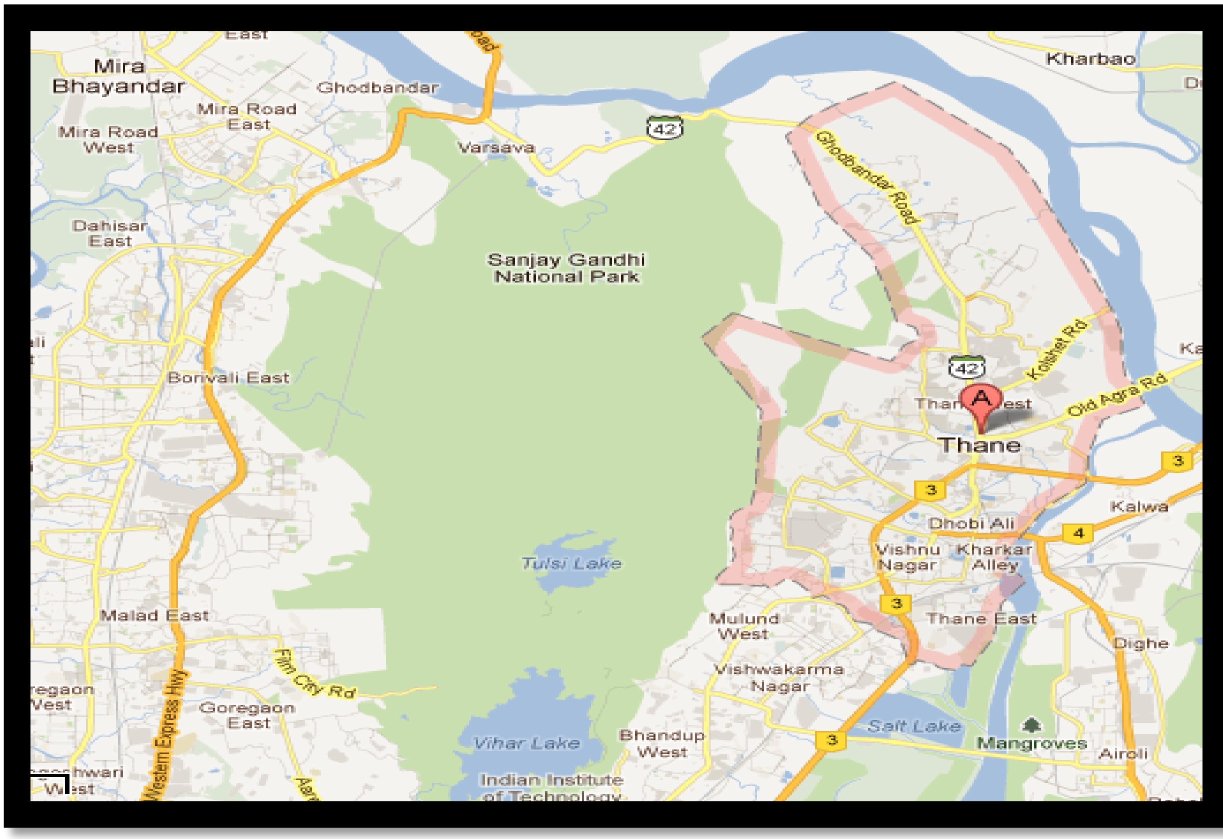


Figure 1 Project Site Ma

Table 11 Location Analysis of the Site-Savarkar Nagar, Thane West, Thane, Maharashtra

DISTANCE FROM THE AIRPORT	20 KM
DISTANCE FROM THE THANE RAILWAY STATION	4.3 KM
EASTERN EXPRESS HIGHWAY, THANE WEST, THANE, MAHARASHTRA	2.7 km
DISTANCE FROM SIDDHI ORTHOPEDIC HOSPITAL	6.6KM
DISTANCE FROM SHAH POLYCLINIC	5.6KM
DISTANCE FROM BIRLA DIAGNOSTIC	6.6 KM

DISTANCE FROM TELEDATA TECNOLOGIES	8.9 KM
DISTANCE FROM SUYASH DIAGNOSTIC CENTRE	4.6KM
DISTANCE FROM JUPITER SCAN CENTRE	4.3 KM
DISTANCE FROM SHREE IMAGING	2.5 KM
DISTANCE FROM RAM PATHOLOGICAL	3.1 KM

4.14 SWOT Analysis

SWOT Analysis of the Location

Table 12 SWOT Analysis of Location

STRENGTH		**WEAKNESS**	
1	20km from the air port and 4.3km from railway station.	1	Cost of electricity very high Rs 6 and back up even higher Rs 12 per unit.
2	Major hotels and malls in 5 Km radius	2	Lack of awareness about diagnostic services
3	Very few competitors in a radius of 5 km	3	Cost of land high Rs 2500 to 4000per sq ft
4	Very High paying capacity of people.	4	Lack of awareness about diagnostic services
5	The average age is high between 40 -60yrs		
6	2.7 Km from Eastern Express Highway		
7	Proper connectivity with Mumbai. New Mumbai, Borivali etc		
8	Road connectivity from all sides		
9	Reputed schools, residential building and commercial sectors		
10	Numerous IT companies are coming up in this area.		
OPPORTUNITIES		**THREATS**	
1	Significant need gap for diagnostic centers in this area.	1	. Major threat from the chain laboratories like Jupiter Diagnostic, Birla diagnostic Centres

2	Many hospitals in the vicinity hence good scope for tie up.	2	Advanced hospitals may not out source any diagnostic services such as Fortis
3	Rapid Metro Rail Thane extension proposed in near future		
4	Population burst predicted in near future		
5	Drainage of patients from this area and surrounding areas can be avoided		
6	Many corporate companies coming up		
7	Relatively a new market for advanced standalone diagnostic and preventive centre		

4.15 Competitior Analysis & Service Mix

Starting up of a new set up requires thorough understanding of the current market scenario, i.e., understanding the competitors and the services that are available. The market for diagnostic centers is huge with about 4000 centers in the country. There is very high competition in the market. But still, there is a huge demand as there are a few areas which are swarming with diagnostic centers, whereas, there are other areas where more are needed.

The market study about the competitors in Thane showed that it has all the major diagnostic chains in the country and many other individual players of the diagnostic centers.

The leading chains are:

- Shah Polyclinic
- Birla Diagnostic Centre
- Suyash Diagnostic centre
- Siddhi Orthopaedic Hospital
- Ram Pathological Laboratory
- Chhaya Society
- Barkhas Diagnostics
- Vaidya Jyoti Ulhas Divekar
- Jupiter Scan Centre
- Shree Imaging

Table 13 . Service Mix

Services	Barkhas Diagnostic Centre	Shree Imaging	Ram Pathalogical Lab	Birla Diagnostic Centre	Suyash Diagnostic Centres	Jupiter Scan Centre
Pathology	Yes	Yes	Yes	Yes	No	No
Special Tests	Yes	Yes	Yes	Yes	No	No
X-ray	Yes	Yes	No	Yes	Yes	Yes
USG	Yes	No	No	Yes	Yes	Yes
Echo	Yes	No	No	Yes	Yes	Yes
B D	No	No	No	Yes	Yes	Yes
Mammography	No	No	No	Yes	Yes	Yes
MRI	No	No	No	Yes	Yes	Yes
CT Scan	No	No	No	Yes	Yes	Yes
OPG	No	No	No	No	Yes	No

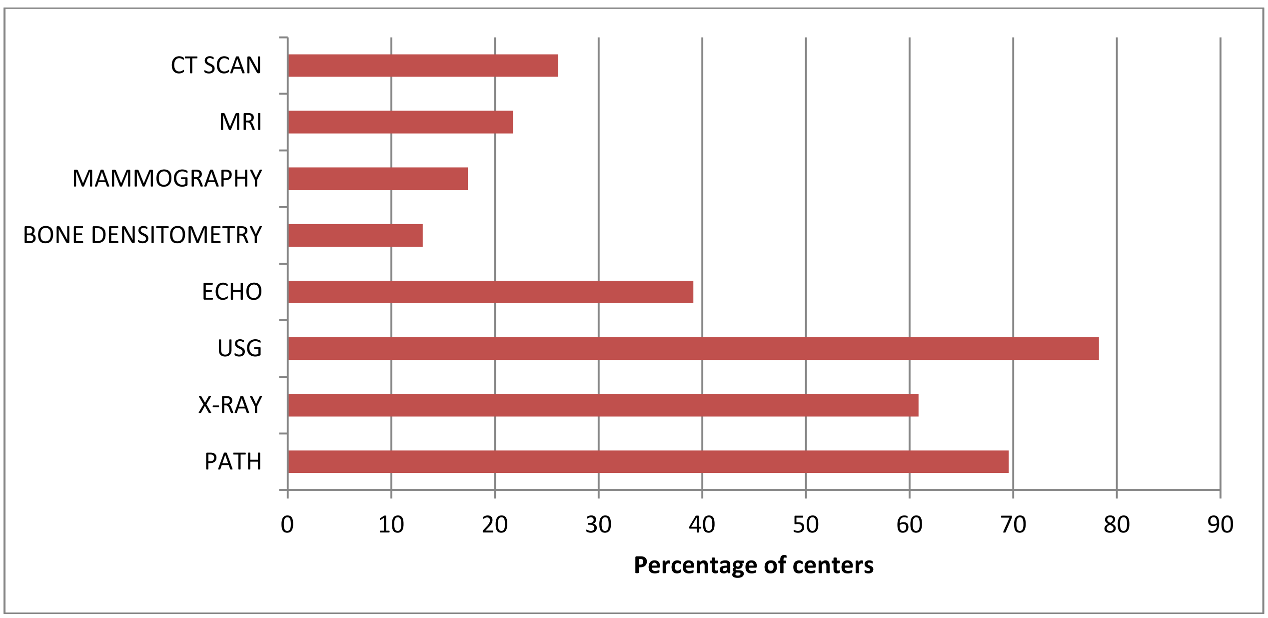


Figure 2 Service Mix of the centers covered during market survey

Availability of Pathology Tests

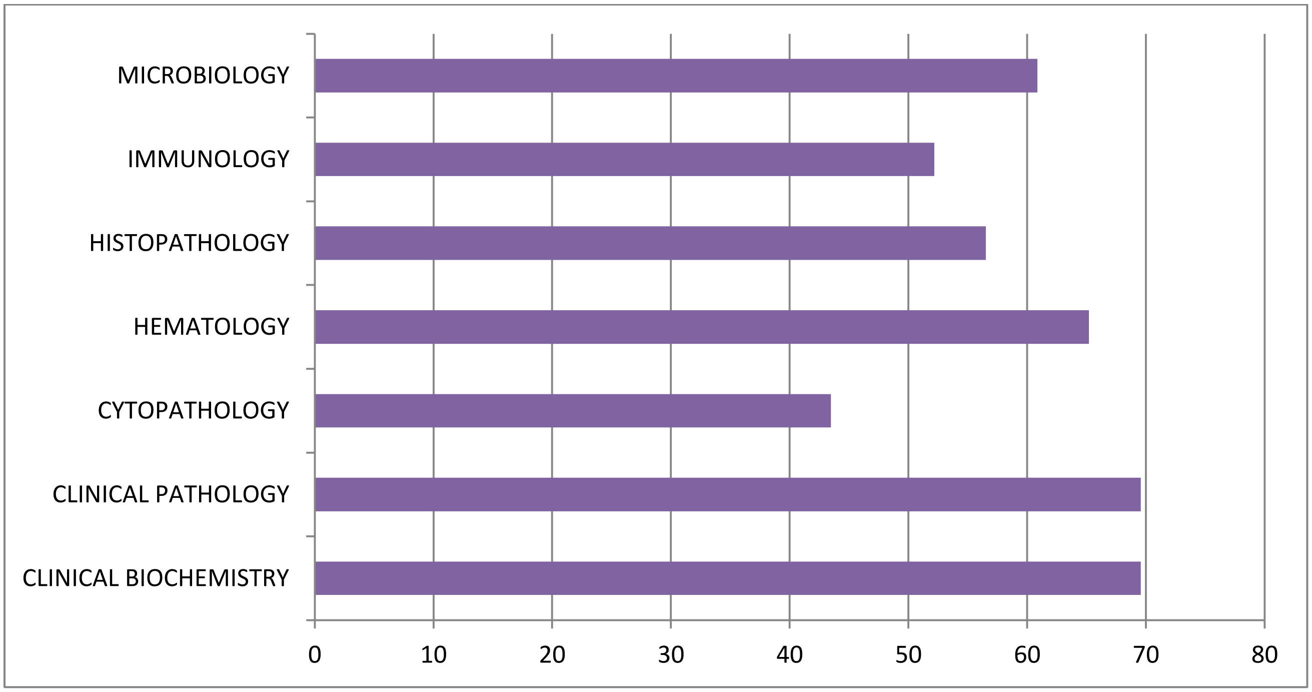


Figure 2 Availability of pathological test according to the market survey

Table 14 Price Mix Comparison

Services	**Barkhas Diagnostic Centre**	**Shree Imaging**	**Ram Pathalogical Lab**	**Birla Diagnostic Centre**	**Suyash Diagnostic Centres**	**Jupiter Scan Centre**
HB	110	80	80	70	NA	NA
TSH	400	300	300	320	NA	NA
X-ray	NA	NA	NA	220		300-10,000
USG	NA	NA	NA	1000		200-1200
Echo	NA	NA	NA	150		
BD	NA	NA	NA	2200		1500-3000
Mammography	NA	NA	NA	1800		2000
MRI	NA	NA	NA	6000	6600	6000-18000
CT Scan	NA	NA	NA	1800	3500	3000-14000

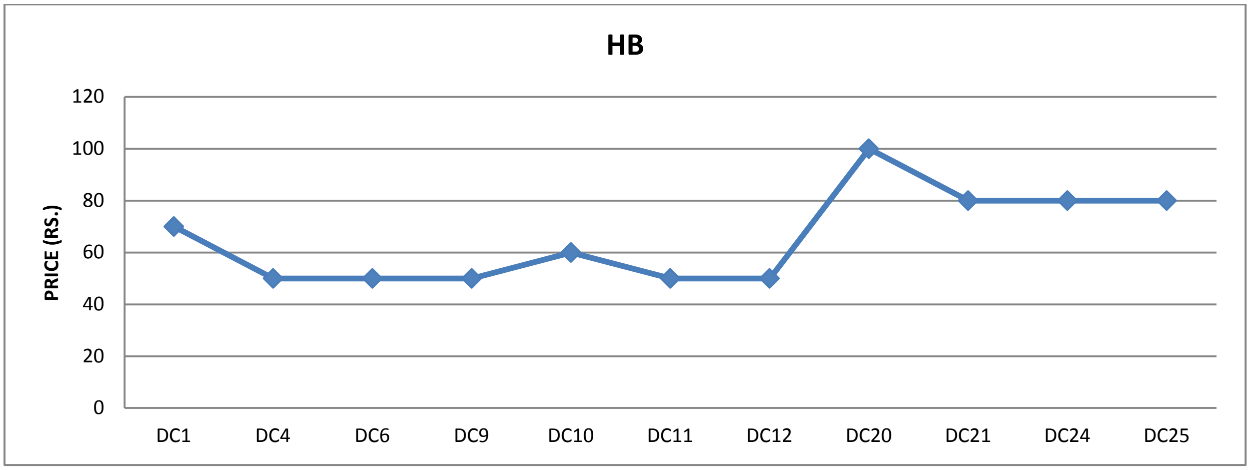


Figure 3 price range for hb varies from Rs 40 to 100 according the market survey findings

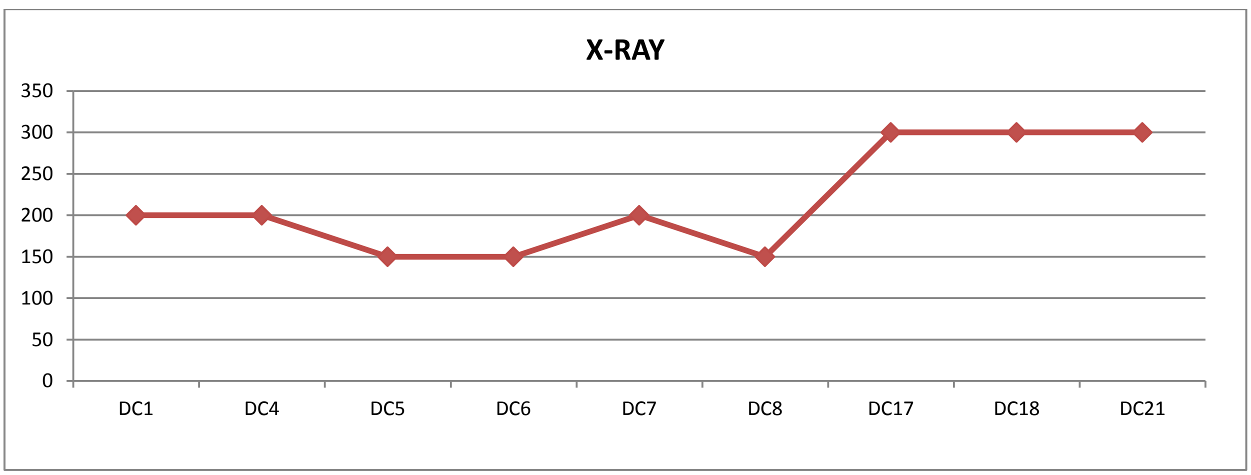


Figure 4 Price for basic X-ray varies from Rs 150 to 300 according the market survey findings.

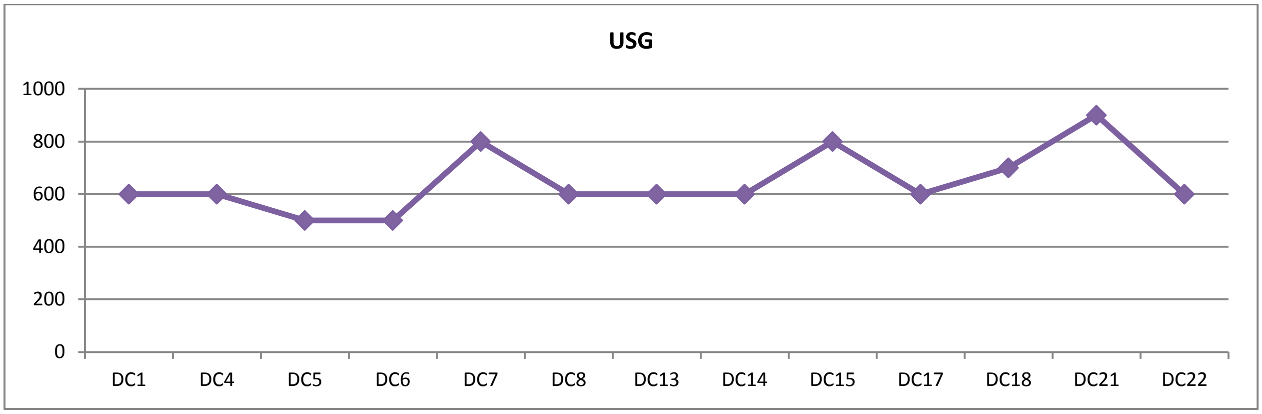


Figure 5 Price for basic USG varies from Rs 450 to 850 according the survey findings.

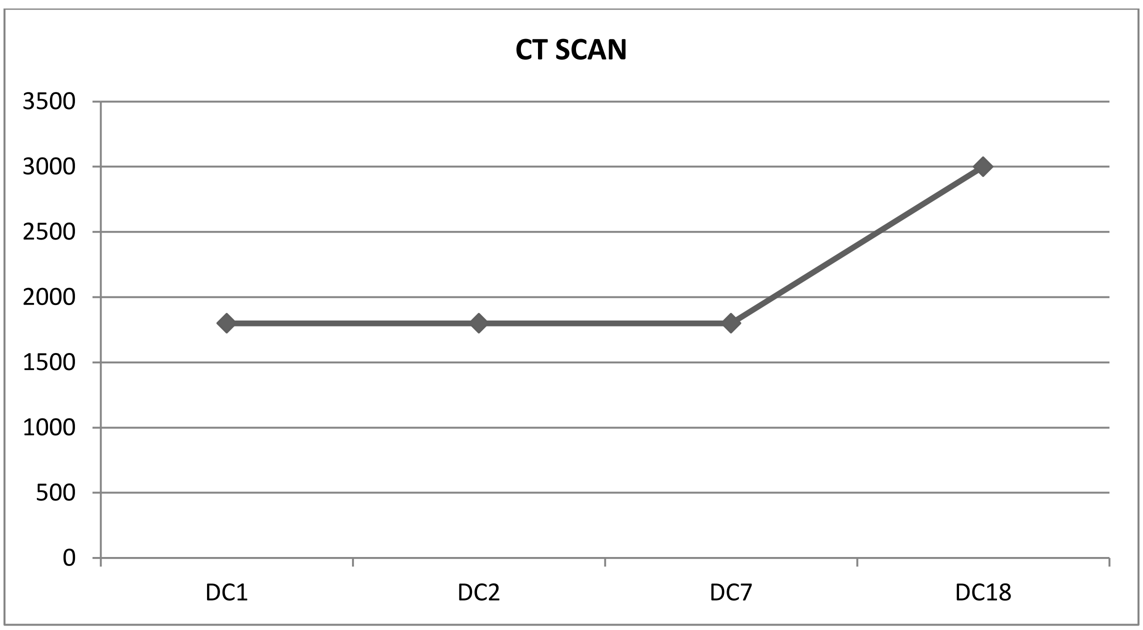


Figure 6. Price range for CT scan is varies from Rs 1800 to 3000

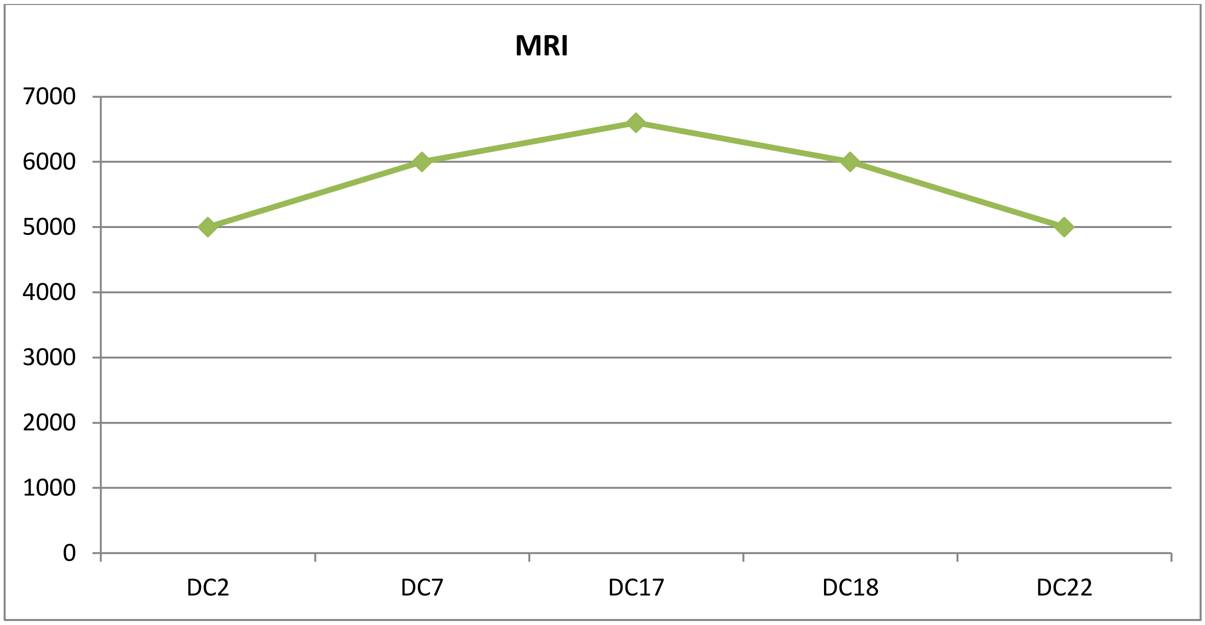


Figure 7 Price for MRI varies from Rs 5000 to 6500

5. **Understanding from the Survey**

From the survey we can deduce that the maximum centres in Thane are offering pathology and USG. The centres for imaging are comparatively much lesser. There is a huge demand for imaging but only a few centres are catering to those needs hence all the patients are being drained by them. Most of these centres are clustered in one area hence the need for more centres arises in different areas.

The current scenario is that Jupiter Diagnostic Centre has the maximum drainage from the market for pathological tests. It is very widely spread in Thane. It has the maximum tie ups with physician's hospitals and the diagnostic centres for conducting the special tests. But many clients are now shifting toward Birla Diagnostic Centre etc

The biggest competitor for imaging services will be Jupiter Scan Centres as it is the oldest centre and is the most advanced stand alone centre in the city of Thane and has the latest technology installed. Suyash Diagnostic Centre is the next for imaging due to its reasonable pricing and quick services. Coming up in a big way are Unique Diagnostic Centre and City Diagnostic Centre which are planning to expand in the near future by installing an MRI scan.

6. **Objectives**

- To understand the current market scenario of diagnostic centre and the facility mix offered.
- To study the need gap of the market and do competitor analysis.
- To do the location analysis and plan the facility mix.

- Estimate the budget required to open up the decided facilities.

7. **Research Methodology**

Research is a systematized effort to gain new knowledge. For carrying out a research or study, different methodologies are applied which have their own pros and cons. Methodology is a systematic procedure to reach to a conclusion part of the study.

7.1 Preliminary Investigation

The study is conducted based on Questionnaire to collect the necessary data; the questionnaire was designed in a manner to get the maximum information needed for the understanding of the current market facility location and price mix.

7.2 Duration of Market Survey

The market survey began on 1st Feb 2012 and went on till 20th Feb 2012.

7.3 Method

Structured Interview method was adopted to carry out this research.

7.4 Tool for data collection

Questionnaire was prepared after discussions with the internal and the external guide.

7.5 Sampling

- ‘Simple Random Sampling’ was used for the diagnostic centers and the Patients.

- The responses were then tabulated and analyzed.

7.6 Sampling Unit

- Survey was carried out in the Thane.

7.7 Sample Size

Diagnostic Centers : 20

Respondents : 50

7.8. Data Collection

- **Primary Data:** Data was collected by carrying out the survey directly among the respondents. There was a structured questionnaire which sleeked response from the respondents. Personal meetings were conducted to collect the information in the form of an interview which was put in the questionnaire by the respondent and me.

- **Secondary data:**
  The Secondary data mainly consists of data and information collected from company records; company profiles offices records and also discussion with employees of the organization, other options include:
    - Internet
    - Brochures
    - Directorate of Census
    - Census of India 2001
    - Sample Registration Survey- 2011
    - CRISIL Research
    - United Nations Population Fund
    - National Family Health Survey (NFHS 3)
    - Economic Survey of Thane (2008-09)

7.9 Data collection instrument development

While preparing the questionnaire, the key factors that contribute towards the topic have to be considered. This enables the construction of the questionnaire easier. Before delivering the questionnaire, plotting or testing the questionnaire effectively is very important. The reasons for this are:

- To test how long it takes to complete
- To check that the questions are not ambiguous
- To check that the instructions are clear
- To allow one to eliminate questions that do not yield data

Developing a checklist for the questionnaire can help spot any of the common mistakes that apply to your questionnaire developed. Some of the important things to be kept in mind are:

- Avoid all leading questions
- Make the questions as specific and simple as possible.
- Make sure all questions are understandable to all the respondents.
- Applicability of the questions to all the respondents
- Make sure none of the questions are double-barreled

7.10 Questionnaire

A structured questionnaire was designed. A Performa of the questionnaire is given in the Annexure at last.[3]

8. **Data Interpretation & Analysis**

During the healthcare market survey of Thane, a sample of 20 professionals and 42 consumers were interviewed. The following are the key findings of these interviews:

Table 15 Healthcare Professionals Interviewed

S. N O.	DESIGNATION	DIAGNOSTIC CENTER	LOCATION
1.	Radiologist	Jupiter Scan Centre	Mg Road, Naupada, Naupada
2.	Radiologist/Proprietor	Shree Imaging	Sanskar Tower,, Dharamveer Marg, Near Gurukul, Panchpakhadi
3.	HR Manager	Birla Diagnostic Centre	Baji Prabhu Despande Road
4.	Radiologist/Proprietor	Dr C S Bhallas Clinic & Diagnostic Centre	Konkan Bhavan
5.	Radiologist	Barkhas Diagnostics	Laxmi Market
6.	Proprietor	Vaidya Jyoti Ulhas Divekar	Edulji Road
7.	Pathologist	Ram Pathological Laboratory	Agra Road, Naupada
8.	Pathologist	Suyash Diagnostic centre	Off Gokhale rd. ,Behind Deodhar hospital, Naupada
9.	Pathologist	_Kalwa Diagnostic Centre	Kalwa Naka, Kalwa
10.	Pathologist/Proprietor	Parul Nursing Home & Diagnostic Centre	Uran
11.	Administrator	Khatri Diagnostic Centre	Mumbra
12.	Receptionist	Radha Diagonostic Centre	Kisan Nagar No 1, Wagle Industrial East,
13.	Assistant	Nagesh Diagnostics	Pokhran Road No 2,
14.	Receptionist	Raw Diagnostic Centre	, Bhiwandi,
15.	Proprietor	Samrath Diagnostic Centre	Mumbai Pune Road, Kalwa
16.	Pathologist/Proprietor	Shree Sai Diagnostics Centre	Mira road
17.	Proprietor	Lifeline Diagnostic	Pokhran Road No 1
18.	Pathologist/Proprietor	Kalwa Diagnostic Centre	kalwa
19.	Radiologist/Proprietor	Parul Nursing Home & Diagnostic Centre	uran
20.	Radiologist	Plasma Diagnostic Laboratories & Blood Bank	Dombivili Industrial Area,

8.1 Need Gap

Professionals in Thane believe that the market of diagnostic centers has been very well tapped. Yet, there is a substantial demand of these services, in spite of the fact that almost all prominent diagnostic centers of this region are providing them. But according to the findings from the market survey, for services like PET CT scan, standing MRI, cephalometry system digital OPG, digital fluroradiography and Cone Beam CT (CBCT), patients go to Mumbai , showing the lack of these services in Thane, which can be seen in Map No. 3.

Special tests, CT scan, MRI, digital radiography, mammography, and bone densitometry are also much required specialties in the region as patients go for these services to the few diagnostic centers clustered in North South and to the major hospitals, which cater to these services.

Most of the consultants and stake holders stated that there is area domination in the field of diagnostic centers in South Thane, so there is a need to open new centers in other areas for the comfort of the patients. The trend followed by most diagnostic centers having pathological services is to outsource their special tests to the leading diagnostic center like Jupiter Diagnostic. Hence arises the need to break the monopoly by opening more specialty test centers.

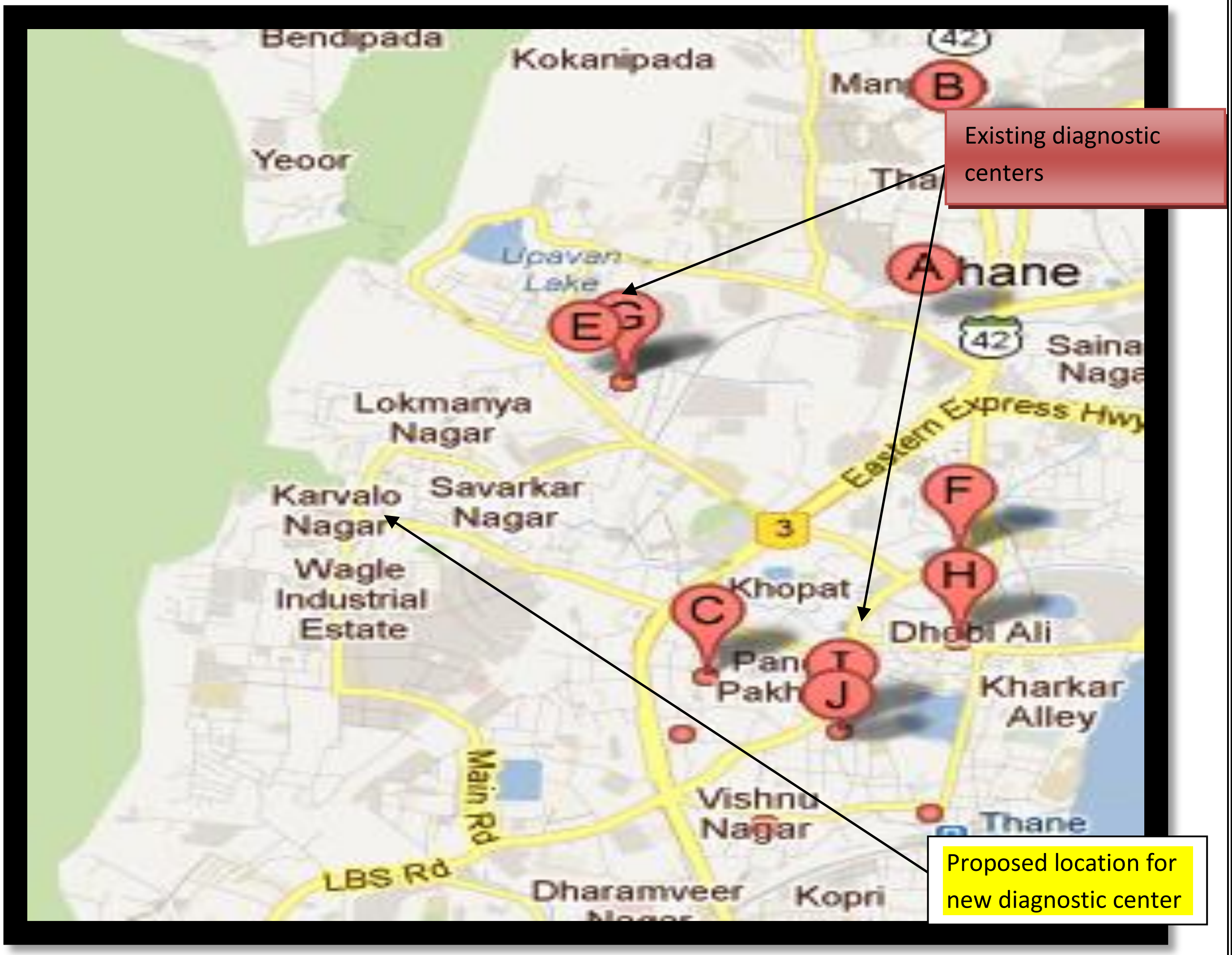


Figure 8 Map showing distribution of diagnostic centers and the proposed area for the set up of the new diagnostic centre.

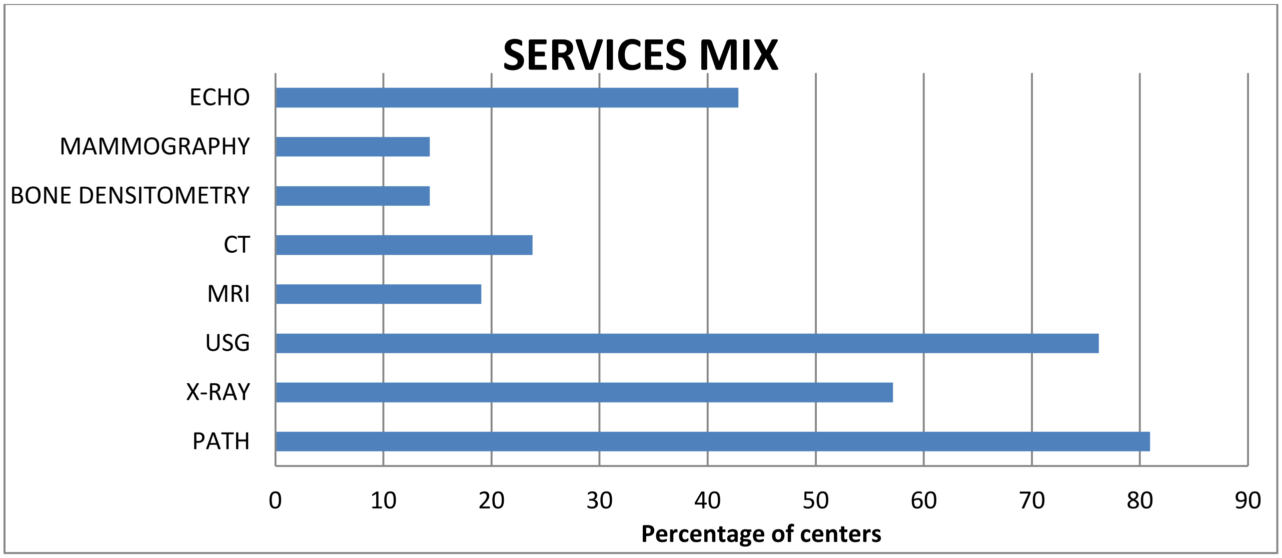


Figure 9 pathology and USG centers in Thane. 90% of diagnostic centers have pathology service according to the market survey finding.

8.2 Patient Referral

According to the market research findings, patients coming to the diagnostic centers are mostly referred by doctors or hospitals or nursing homes. 45 percent of the patients come in as walk ins for follow up tests and preventive packages. The rest are corporate clients or referred by TPAs.

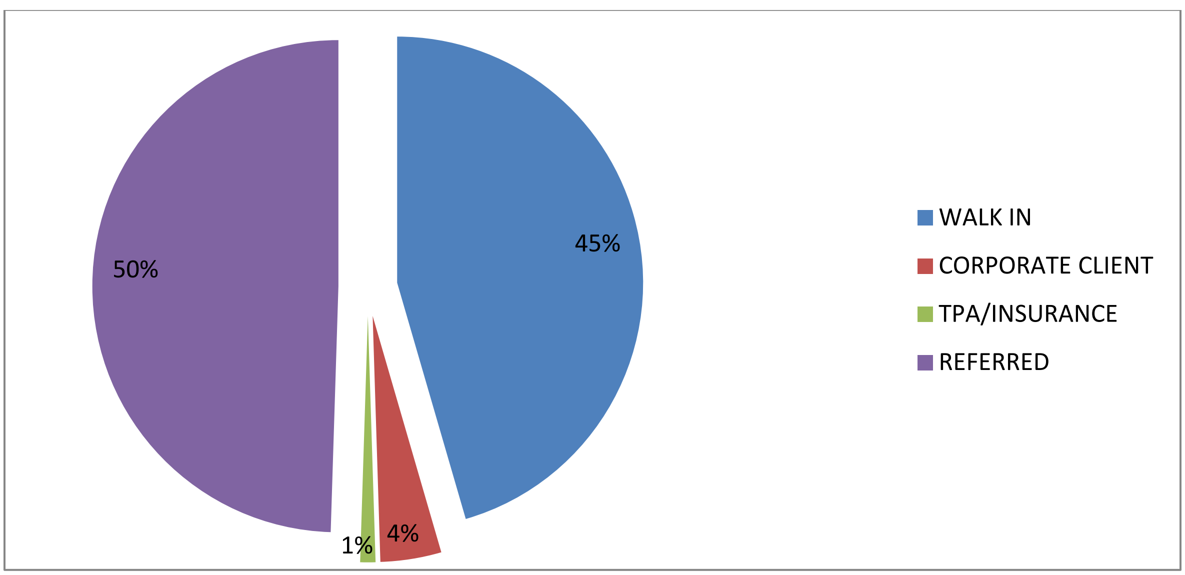


Chart1 Referral pattern

8.3 Paying Capacity

The market survey shows that the paying capacity of patients coming to the diagnostic centers varies from low to high income group. The maximum patients belong to the middle income group, followed by high income group and finally low income group.

Most of the professional interviewed believe that majority of the population is willing to pay for accuracy and quality of reports and services as the general population has become more health oriented.

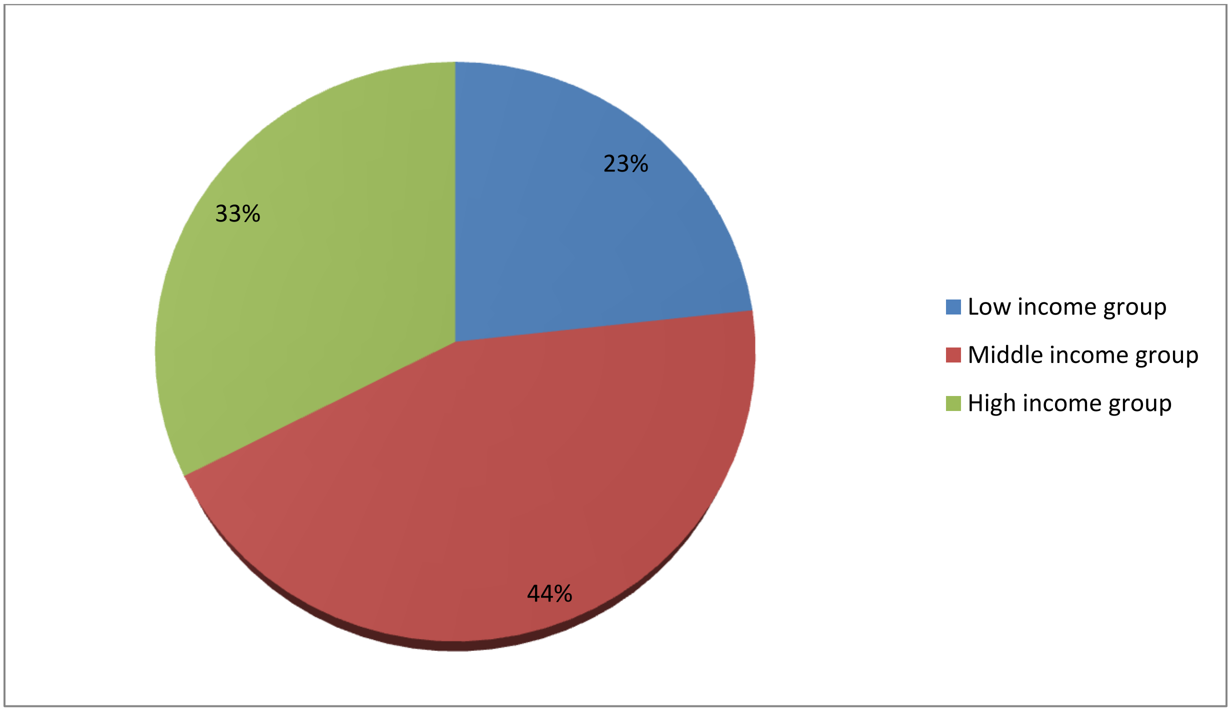


Chart2 Paying Capacity of Patients

8.4 Purpose Of Visit

The market survey shows that 90 percent people visiting the diagnostic center come for routine diagnostic services. With the changing lifestyles and growing awareness of preventive healthcare, many people have started opting for services such as health checkups, preventive packages and control programs for diabetes, obesity, etc. in a big way. The fact that India is the future hub for clinical trials has encouraged many diagnostic centers to start such trials.

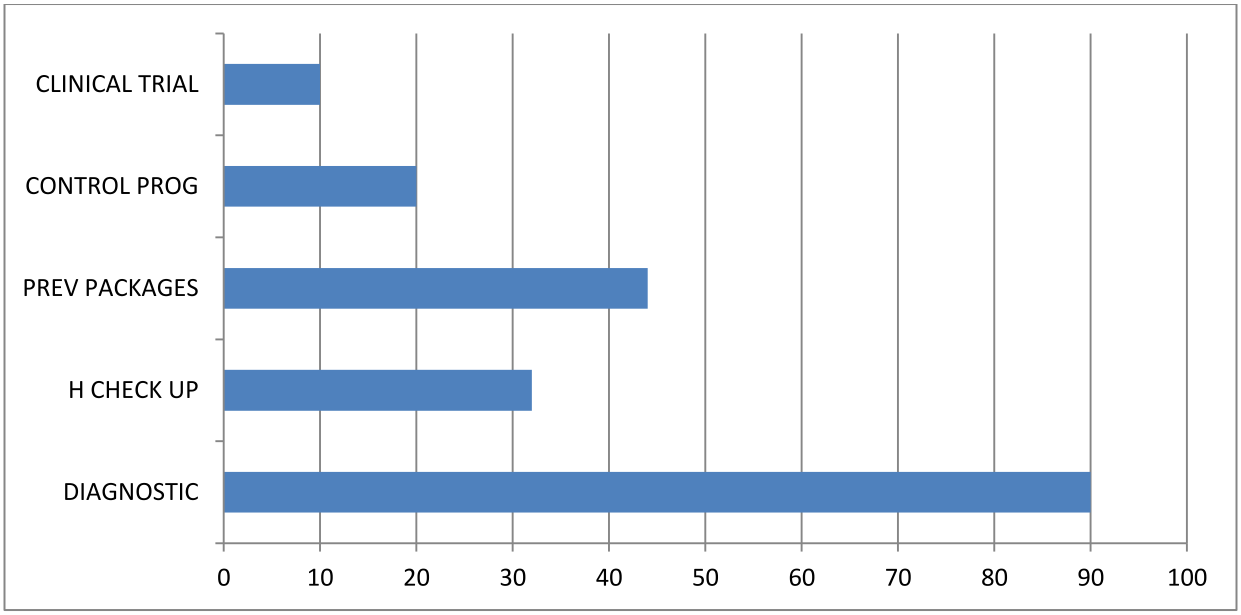


Figure 10 Purpose of Visit.

8.5 Average Number of Patients Per Service

According to the market survey, it is quite clear that the demand for pathology is very high. On an average, about 60 patients visit a diagnostic center for pathology services, whereas, only about 5 people visit for Echocardiogram. The demand for imaging services like MRI, and CT ranges from 14 to 20 patients, whereas, for USG and X-rays it ranges from 24 to 36 patients per day.

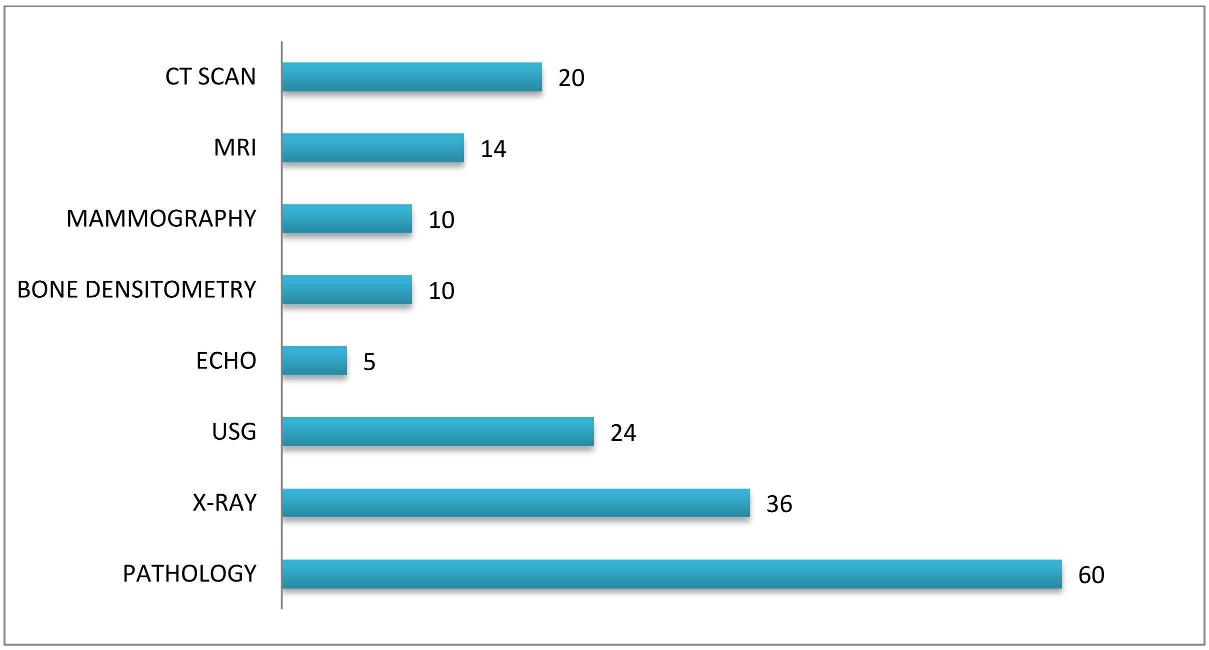


Figure 11 Average Number of Patients per Service

8.6 Quality parameters

Some centers are following strict quality parameters, whereas, there are a few that are not following any quality parameter. According to the market survey, it was found that 44 percent of the diagnostic centers that were visited had ISO certification, and 20% were accredited by NABL. The major diagnostic chains of India, present in Thane, follow stringent quality measures. About 12% of the centers visited were accredited by CAP, USA.

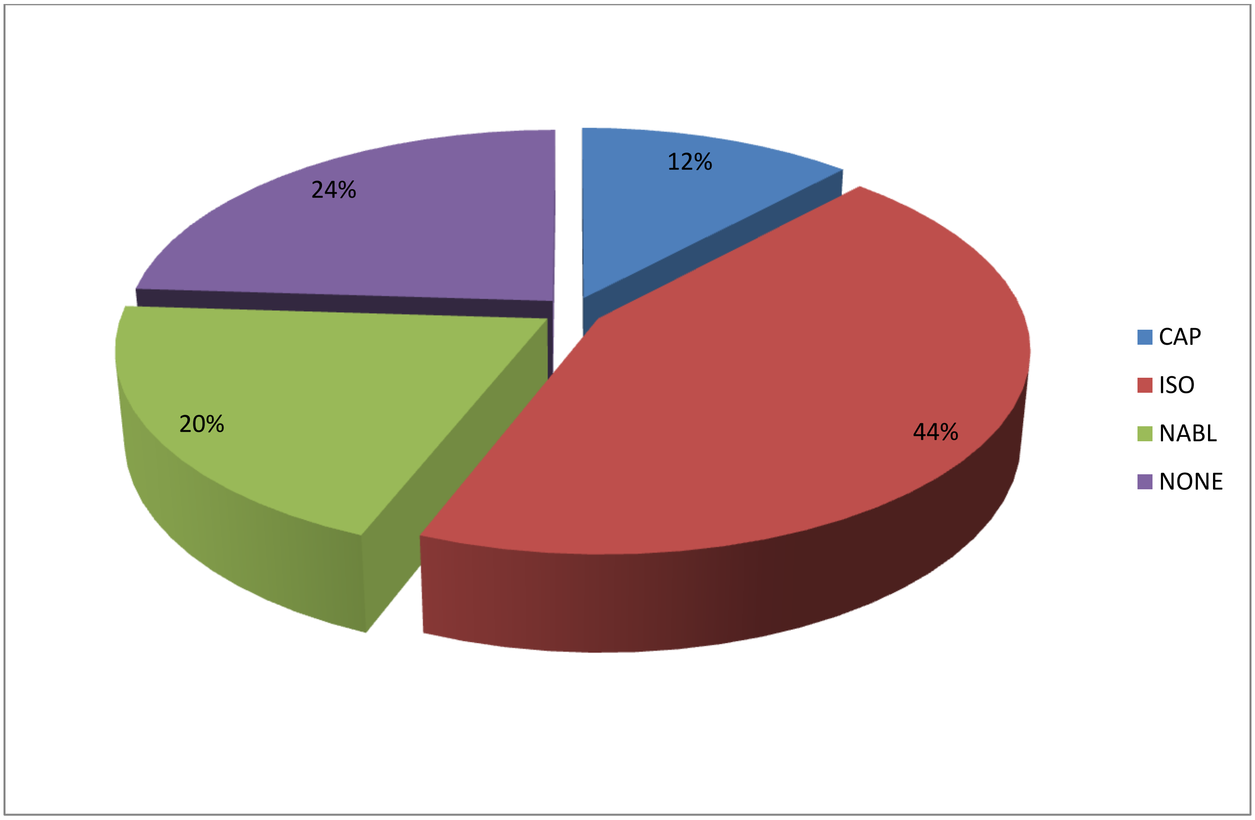


Chart 3 Quality parameters

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9. **Project Conceptualization**

The market survey analysis and the professional interview revealed that an advance and specialized preventive and diagnostic centre including MRI, CT scan and PET scan and a centre for research and development through clinical trials is the most feasible option in the southern periphery of golf course road.

Table 16 Facility Mixes

SERVICE MIX
RADIOLOGICAL SERVICES
1. CT Scan 6 slice
2. Ultrasound with Colour Doppler 4 D
3. Whole body MRI 1.5 Tesla
4. Dental cone beam CT
5. Digital X-ray & fluoroscopy 1000mA
6. Digital orthopantomography
7. DEXA Bone densitometry
8. Echo cardiographs
9. ECG
10. Mammography
11. Pet imaging
12. Nuclear medicine imaging
CORPORATE HEALTH CARE
1. Pre Insurance health check up
2. Remote pathology testing services
3. Preventive health check up
4. Pre-Employment Health Screening

5. Employee Annual Health Checkups
6. Drug-Abuse Screening
SCHEMES AND PACKAGES:
1. Executive health check Profile
2. Executive check – Heart Profile
3. Executive check Profile
4. General Health Check Profile
5. Heart check profile
6.Healthy Bride Panel

10. **Proposed Machinery for Radiology**

Table 17 Proposed Machinery For Radiology

MACHINE	UNIT IN LACS
Pet CT Scan 6 slice	1
Dental cone beam CT	Application
Whole body MRI 1.5 Tesla	1
Digital X-ray & fluoroscopy 1000mA	1
Digital orthopantomography	1
Portable x-ray	1
DEXA Bone densitometry	1
ECG machine with interpretation	2
Mammography	1
Color Doppler 4 D with probes and accessories	1
Ultrasound Machine with Echo	1
Portable USG machine	1
Automatic film processor	1

11. **Staff Requirement: Total 52 Employers**

Table 18 Staff Requirement: Total 52 Employers

CLINICAL STAFF	**NO**	**SALARY**	**TOTAL EXPENSES**
Radio Diagnostics	1	60000	60000
Cardiologists	1	60000	60000
USG specialist	1	50000	50000
Radiologist(Imaging)	1	50000	50000
Senior Technician	4	12000	48000
Junior Technician	10	8000	80000
Nurses	4	5000	20000
ADMINISTRATIVE STAFF			
CEO	1	80000	80000
Manager(Account, Finance, Hr)	3	25000	75000
Clerical staff	Out source	8000	10000
Supportive staff	Out source	8000	10000
TOTAL			540000

12. **Space Requirement**

1. **CT SCAN AND MRI**
   This department needs the maximum planning and will be the biggest revenue generating market in future. To optimize the space utilization we can have a common viewing and function area for the two machines. All the other rooms will be separate.

Table 19 Space Requirement(Common for X-Rays)

COMMON:	**AREA IN SQ FT**
Viewing room	100
Patient preparation room pre imaging	120
Technologist lounge and conference room	100

PET CT	
Imaging area	650

MRI	
Imaging area	500

2. COMMON for X-rays

Physicians room	100
Space reqd	**350**

i. DIGITAL X- RAY:

Patient preparation room pre imaging	100
Imaging area	200
Control booth	350

ii. BONE DENSITOMETRY

Patient preparation room pre imaging	100
Imaging area	200
Control booth	250

iii. DIGITAL OPG

Patient preparation room pre imaging	100
Imaging area	200
Control booth320	250

iv. MAMMOGARPY

Patient preparation room pre imaging	100
Imaging area	200
Control booth	250

3. COMMON

Technologist lounge	75
Physicians office	100
Wash room	75

i. ECG

Procedure room	150

ii. USG AND ECHO

Procedure room	200

iii. COLLECTION CENTRE FOR SAMPLES

Collection room	150
Storage room	120

4. ADMINISTRATION

Table 20 Space Requirement(Administration)

RECEPTION	100
PATIENT WAITING ROOM	400
LIFTS, CORRIDORS AND PASSAGES	1000
ADMINISTRATION	450
WASH ROOMS	120 * 4=480
GENETRATOR AND AC	100
EQUIPMENT CALIBRATION ROOM	180
CONSULTATION ROOM	250
CLINICAL TRIALS	1000
R & D	400
PARKING AND LANDSCAPING	1000
WASTE STORAGE	75
RADIATION COUNT ROOM	150

13. Cost Estimation

Table 21 Total Expense

Expenses	**Cost per unit**	
Cost of land 2000 sq ft	3500	7000000
Construction cost 3000 per sq	10000	30000000
Total cost of medical equipment		66150000
Total cost of non medical equipment		2205000
TOTAL BUILDING COST		**105355000**

Table 22 Project Cost

1. PROJECT COST		
DOWN PAYMENT 30%[i]		31606500
ONLY INTERST FOR 1 YR	860400	10324800
CONSUTANCY FEE	3%	3160650
PRE OPERATIONAL EXPENSES	100000	1200000
TOTAL PROJECT COST		**46291950**

Table 23 P & L Statement

2. P & L Statement					
INCOME PER YEAR	48,183,300	70,253,750	86,729,940	109,279,724	134,882,403
TOTAL EXPENSE	30,924,343	31,745,463	39,354,073	40,849,571	42,464,709
PBDIT MARGIN %	36	55	55	63	69
PBDIT	17,258,957	38,508,287	47,375,867	68,430,153	92,417,693
DEPRECIATION 15 %(-)	9,922,500	8,434,125	7,169,006	6,093,655	5,179,607
PBIT	7,336,457	30,074,162	40,206,861	62,336,498	87,238,086
INTEREST	8,071,852	6,620,251	5,000,672	3,193,678	1,177,581
PBT	-735359	23453911	35206189	59142820	86060505
Tax (35%)		8208869	12322166	20699987	30121177
PAT	-735359	15245042	22884023	38442833	55939329

3. CASH FLOW STATEMENT					
PROFIT AFTER TAX	778326450.5	1143661966	1416201162	1789454682	2213365078
DEPRECIATION 15%	211310348.6	310496461	384489003.3	485824800.6	600913595.8
EMI(-)	20591988	20591988	20591988	20591988	20591988
NET CASH FLOW STATEMENT	**969044811**	**1433566440**	**1780098178**	**2254687495**	**2793686686**

Table 24 Medical Equipment Cost

Medical Equipment cost:	
CT Scan 64 slice with cardiac	22,500,000
Ultrasound with echo	1850000 cardiac
Whole body MRI 1.5 Tesla	30,000,000
Dental cone beam CT	1000000 app
Digital X-ray & fluoroscopy 1000 mA	3,500,000
Digital orthopantomography	1,600,000
DEXA Bone densitometry	1,500,000
ECG WITH INTERPRETER	150,000
Mammography	3,500,000
Automatic film processor	200,000
Portable USG with colour Doppler	1,600,000
portable x ray	1,600,000
TOTAL MEDICAL EQUIPMENT COST	**66,150,000**

Table 25 Non- Medical Equipment Cost

Non Medical Equipment cost		
Computers 15000	10	105,000
Beds	8	40,000
Tables	50	150,000
chair sofa	200	300,000
Furniture wood work, closets etc.	20	50,000
FRIDGE AND TV		20,000
GENERATOR	2	200,000
LIFT	1	100,000
Contingency	1	140,000
Ambulance	4	350,000
stretchers and wheel chair 2		15,000
Ac	15	240,000
water cooler	3	30,000
linen curtains mattresses		15,000
lights	1,000	200,000
server(60 tera bytes)		250,000
TOTAL NON MEDICAL EQUIPMENT		**2,205,000**

Table 26 Civil Expenses

CIVIL Expenses	Cost per unit	
Built up area	10,000	
Cost of land 2000 sq ft	3,500	7,000,000
Construction cost 3000 per sq	10,000	30,000,000
TOTAL BUILDING COST		**37,000,000**

Table 27 Operational Expenses

Operational expenses:			
Materials		25,000	300,000
Electricity	6/unit	100,000	1,200,000
Back up rate	12/unit	100,000	1,200,000
EXPENSES OF STAFF	52	540,000	6,480,000
MISCELANEOUS		2,000	24,000
TOTAL OPERATIONAL EXPENSES			**9,204,000**

Table 28 Overheads

OVER HEADS	
Marketing cost	1,000,000
Maintenance and repair	60,000
TOTAL OVER HEADS EXPENSES	**1,060,000**

Table 29 Insurance

CMC	10% of the actual cost	6,721,800
INSURANCE	0.001	68,355
EMI @ 14	1,715,999	20,591,988

Table 30 Maintenance

Maintenance	
Insurance on med equip	66150
Insurance on non equip	2205
Total	**68355**
CMC MED EQUIPMENT	6615000
CMC NON MED EQUIPMENT	102500
Total	**6,717,500**

Table 31 Expenses Per Year

EXPENSES PER YEAR					
	1st YEAR	**2nd YEAR**	**3rd YEAR**	**4TH YEAR**	**5TH YEAR**
OPERATIONAL EXPENSES	9,204,000	9,940,320	10,735,546	11,594,389	12,521,940
OVER HEADS	1,060,000	1,144,800	1,236,384	1,335,295	1,442,118
CMC			6,721,800	7,259,544	7,840,308
INSURANCE	68,355	68,355	68,355	68,355	68,355
EMI	20,591,988	20,591,988	20,591,988	20,591,988	20,591,988
TOTAL EXPENSE	**30,924,343**	**31,745,463**	**39,354,073**	**40,849,571**	**42,464,709**

Table 32 Maximum Usage

MAXIMUM INCOME				
	MAXIMUM USAGE			
	TIME	PTS	RATES	INCOME
No. of working days/annum	310			
USG AND DOPPLER	24 hrs	60	900	54,000
X RAYS	12 hrs	80	250	20,000
ECG	12 hrs	25	150	3,750
CT SCAN	24 hrs	30	3,200	96,000
COMMISSION FROM	0.4	800	200	64,000

OUTSOURCING				
X RAYS AT HOME		10	400	4,000
USG at home		10	1,000	10,000
AMBULANCE CHARGES	24 HRS	20	200	4,000
MRI	24 hrs	25	5,000	125,000
MAMMOGRAPHY	12 hrs	15	1,600	24,000
BD	12 hrs	15	1,800	27,000
TOTAL INCOME PER DAY	1DAY	1,090		431,750
INCOME PER MONTH	30 DAY	32,700		12,952,500
INCOME PER YEAR	**310 DAY**	**337,900**		**133,842,500**

Table 33 Income Per Year (1st Year)

INCOME PER YEAR	**1ST YEAR**		
	40%		
	PTS	**RATES**	**INCOME**
USG AND DOPPLER	24	810	19,440
X RAYS	32	225	7,200
ECG	10	135	1,350
CT SCAN	12	2,880	34,560
COMMISSION FROM OUTSOURCING 40%	320	180	23,040
X RAYS AT HOME	4	360	1,440
USG at home	4	900	3,600
AMBULANCE CHARGES	8	180	1,440
MRI	10	4,500	45,000
MAMMOGRAPHY	6	1,440	8,640
BD	6	1,620	9,720
TOTAL INCOME PER DAY	436		155,430
INCOME PER MONTH	13,080		4,662,900
INCOME PER YEAR	**135,160**		**48,183,300**

Table 34 Income Per Year (2 nd Year)

INCOME PER YEAR	2ND YEAR		
	50%		
	PTS	RATES	INCOME
USG AND DOPPLER	30	900	27,000
X RAYS	40	250	10,000
ECG	13	150	1,875
CT SCAN	15	3,200	48,000
COMMISSION FROM OUTSOURCING 40%	400	250	40,000
X RAYS AT HOME	5	350	1,750
USG at home	5	1,000	5,000
AMBULANCE CHARGES	10	200	2,000
MRI	13	5,000	62,500
MAMMOGRAPHY	8	1,800	13,500
BD	8	2,000	15,000
TOTAL INCOME PER DAY	545		226,625
INCOME PER MONTH	16,350		6,798,750
INCOME PER YEAR	**168,950**		**70,253,750**

Table 35 Income Per Year (3 rd Year)

INCOME PER YEAR	3RD YEAR		
	60%		
	PTS	RATES	INCOME
USG AND DOPPLER	36	972	34,992
X RAYS	48	270	12,960
ECG	15	162	2,430
CT SCAN	18	3,456	62,208
COMMISSION FROM OUTSOURCING 40%	480	216	41,472
X RAYS AT HOME	6	432	2,592
USG at home	6	1,080	6,480
AMBULANCE CHARGES	12	216	2,592
MRI	15	5,400	81,000
MAMMOGRAPHY	9	1,728	15,552
BD	9	1,944	17,496
TOTAL INCOME PER DAY	654		279,774
INCOME PER MONTH	19,620		8,393,220
INCOME PER YEAR	**202,740**		**86,729,940**

Table 36 Income Per Year (4 th Year)

INCOME PER YEAR	4TH YEAR		
	70%		
	PTS	RATES	INCOME
USG AND DOPPLER	42	1,050	44,090
X RAYS	56	292	16,330
ECG	18	175	3,062
CT SCAN	21	3,732	78,382
COMMISSION FROM OUTSOURCING 40%	560	233	52,255
X RAYS AT HOME	7	467	3,266
USG at home	7	1,166	8,165
AMBULANCE CHARGES	14	233	3,266
MRI	18	5,832	102,060
MAMMOGRAPHY	11	1,866	19,596
BD	11	2,100	22,045
TOTAL INCOME PER DAY	763		352,515
INCOME PER MONTH	22,890		10,575,457
INCOME PER YEAR	**236,530**		**109,279,724**

Table 37 Income Per Year (1st Year)

INCOME PER YEAR	5TH YEAR		
	80%		
	PTS	RATES	INCOME
USG AND DOPPLER	48	1,134	54,420
X RAYS	64	315	20,155
ECG	20	189	3,779
CT SCAN	24	4,031	96,746
COMMISSION FROM OUTSOURCING 40%	640	252	64,497
X RAYS AT HOME	8	504	4,031
USG at home	8	1,260	10,078
AMBULANCE CHARGES	16	252	4,031
MRI	20	6,299	125,971
MAMMOGRAPHY	12	2,016	24,186
BD	12	2,267	27,210
TOTAL INCOME PER DAY	872		435,105
INCOME PER MONTH	26,160		13,053,136
INCOME PER YEAR	**270,320**		**134,882,403**

ROI	**4 YEARS 9 MONTHS AND 15 DAYS**

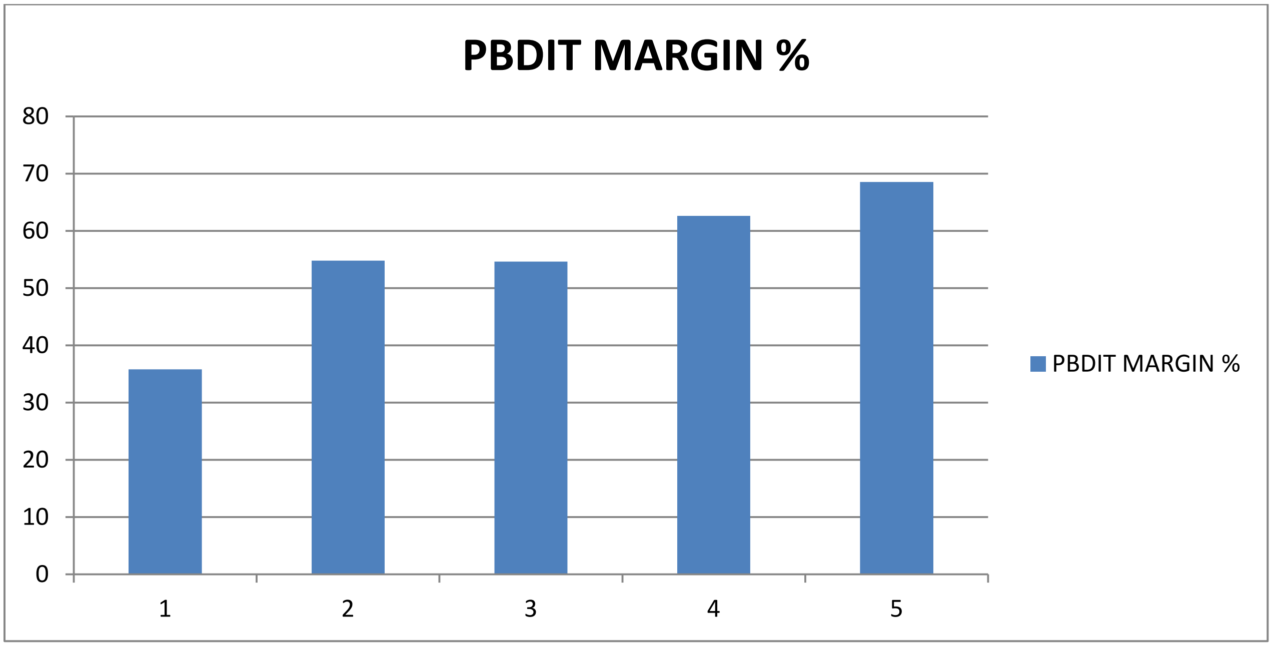
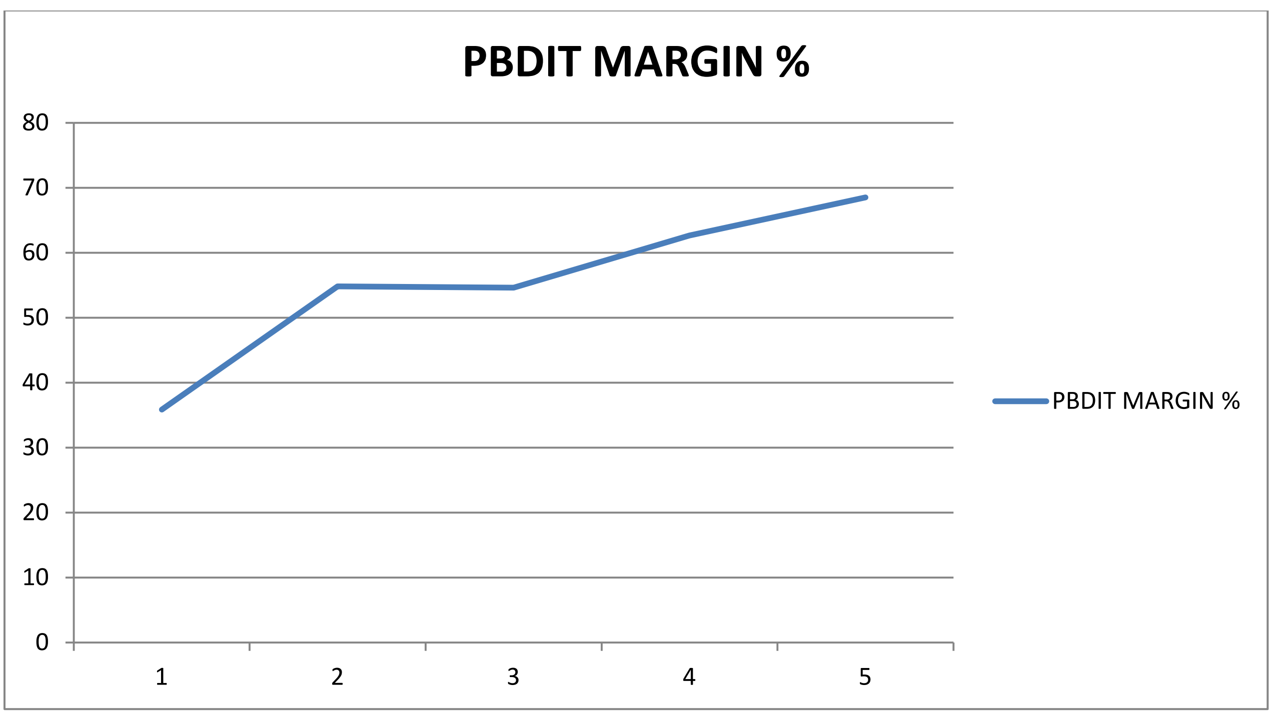


Figure 12 PBDIT Margin%



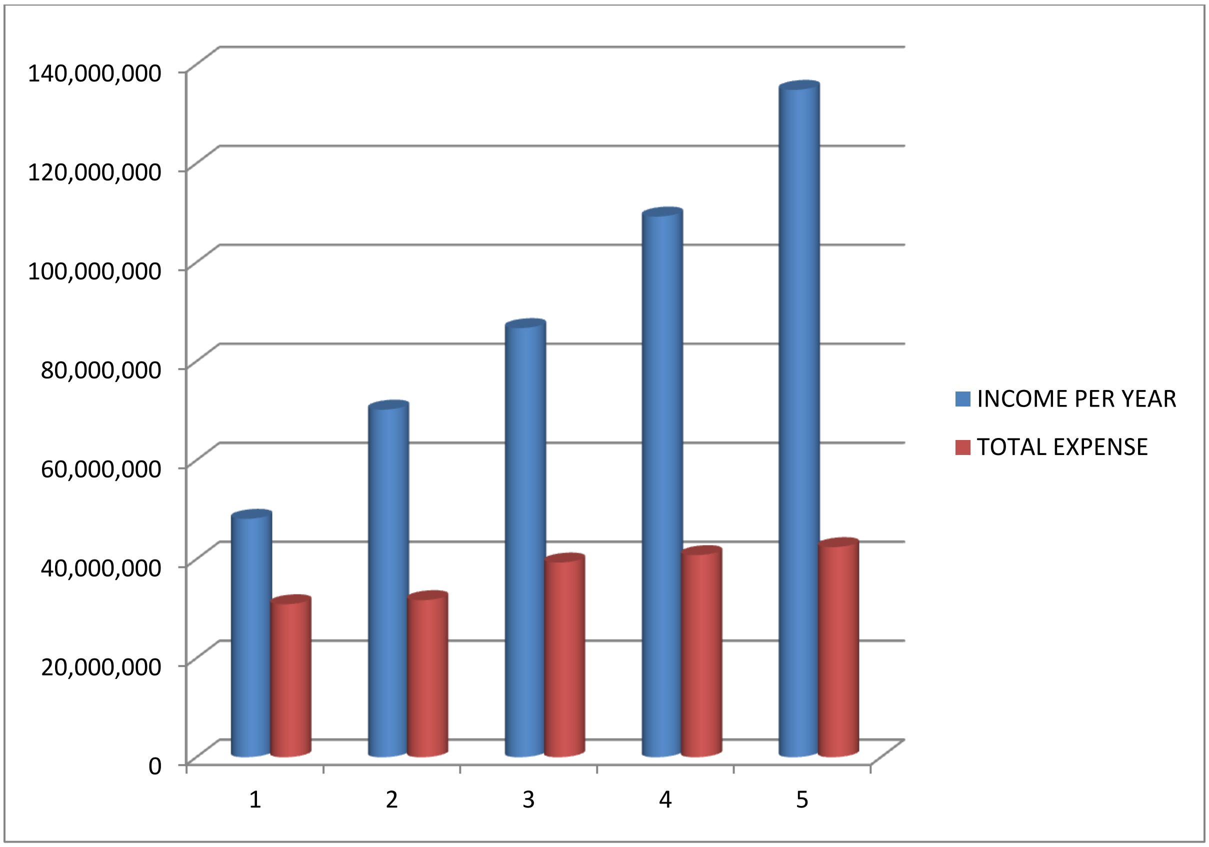


Figure 13 Income & Total Expense

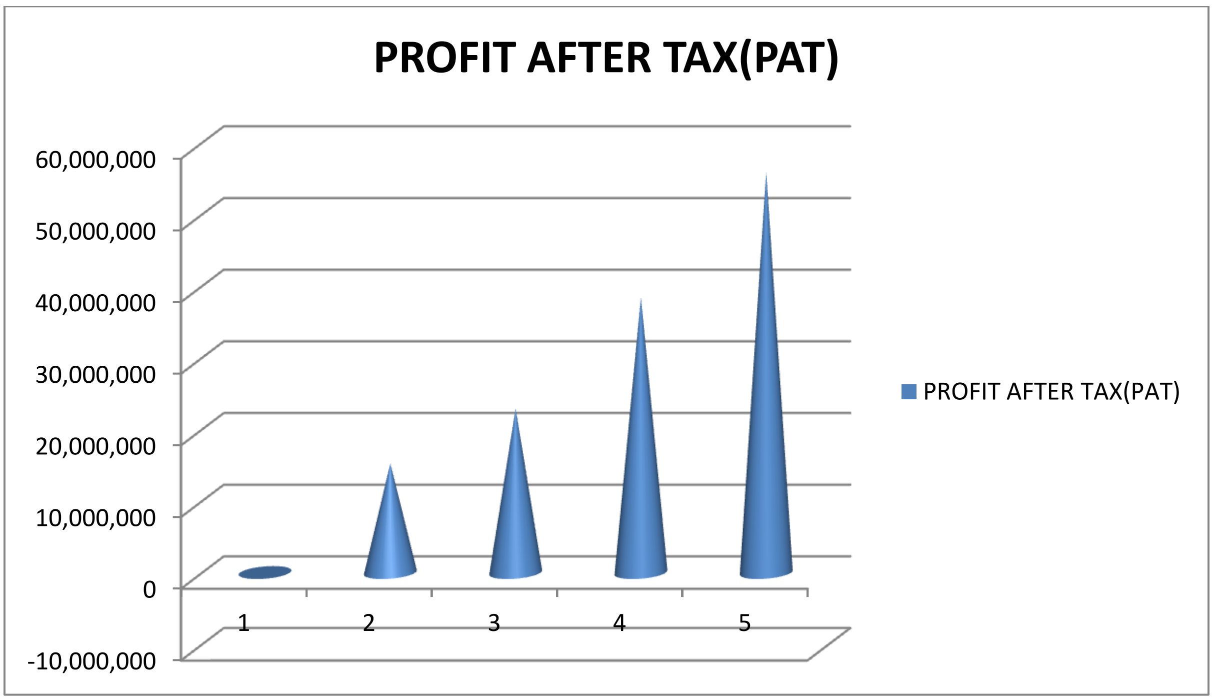


Figure 14 Profit After Tax (PAT)

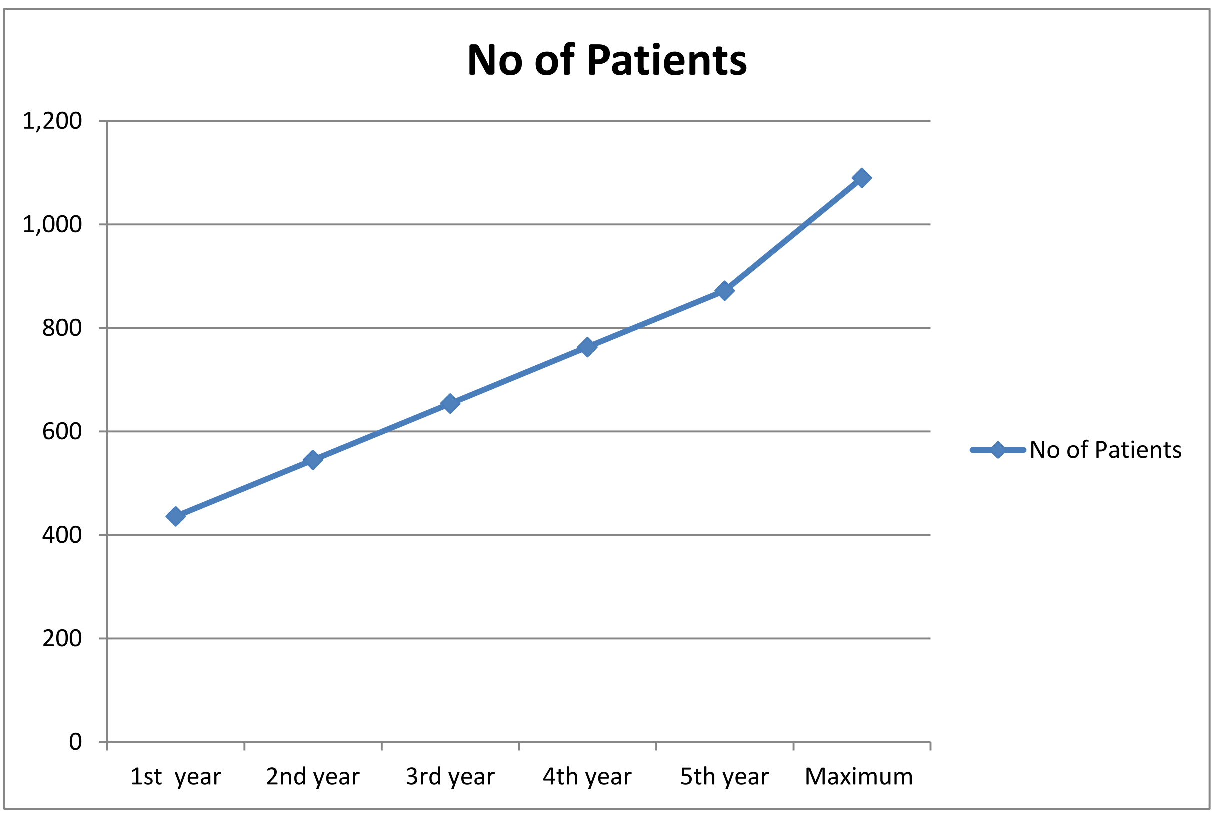


Figure 16 No. of Patients

14. **<u>Key Success Factors</u>**

1. **Location**: one of the biggest success factors is the strategic location of the project.
    - The average age of the people in this area is mostly between 40 to 60yrs with very high paying capacity.
    - Many hospitals in the vicinity and many more big hospitals are coming up like Fortis etc hence it good scope for tie up with them.
    - Numerous IT companies are coming up and many reputed schools, residential building and commercial sectors in this area making this area a target location.
    - Adjoining belt of Maharashtra including areas of Thane , Mulund are major catchment areas as these areas lack advance diagnostic facilities hence drainage of patients from this area will be an advantage.

2. **Schemes and packages** offered here are very attractive and a wide range is offered from organ specific test to age specific to disease specific, profession specific, etc. Additional and optional benefits for those who want are also given e.g. get a cardiac CT in the package for just Rs 500 extra. This will help increase the foot fall for CT scans.

3. **Paying capacity**: Thane also called the millennium city has the 3rd highest paying capacity in the country. This is due to major IT companies having their presence here. More over people are aware and conscious for their health so are willing to pay higher prices for quality service.

4. **Population burst** is expected toward the south periphery of Thane in nearly to 300 People per Acre, many people will be moving from the central parts and old Thane as this part is well planed and organized unlike old Thane. There are many high class residential projects coming up in this area it will soon become the most expensive area in Thane.

5. **Competition**: Although Thane has more than 100 diagnostic centre but this area is left untapped. There are very few competitors in new Thane and even lesser in a radius of 10 km. Hence very good scope for development and growth.

6. **New market**: Relatively a new market for advanced standalone diagnostic and preventive centre therefore excellent scope for growth in near future as people are becoming more conscious about their health and instead of going for therapeutic test they are going in for preventive packages.

7. **Development plan** of this area will attract many migrations in near future and thus increase the need for health care. A population growth of around 60% is the trend in the last decade and is expected to continue in the near future.

15. **The Way forward**

1. The centre will follow the best quality parameters the practice system, policies and process will be in line with the NABL system this will help in gaining a competitive advantage in the market.

2. This diagnostic centre is having 12 imaging specialties at the start up with time it will regularly update by installing latest technologies e.g. Pet CT scan, standing Mri etc.

3. The centre will follow all the LEED norms and energy conservation methods to make the building environment friendly and also to save substantial money in the long run.

4. The centre will be following all the registrations, licensing and statutory obligations need to be fulfilled for a diagnostic centre.

5. The centre must have more and more tie up especially with cardiac and cancer hospitals to utilize its Pet CT and MRI to optimum level.

6. World class quality service will be provided hence no compromise on the qualification of the staff. Highly qualified staff with vast experience in India and abroad will be working with full dedication

7. Establish good will by proving substantial discounts to the poor and under privileged and having tie-up with government bodies like CGHS, railways employees and Army personnel's to complete our duty towards our nation.

16. **Findings**

The market of Diagnostic centre has been well tapped in Thane. All the latest diagnostic facilities are available in the multi specialty hospitals. With over 100 diagnostic centers are present in Thane alone.

The paying capacity and the willing to pay for quality service are very high in Thane. And that's one of the main reasons for increase in demand in preventive health care and health packages.

From the survey we can deduce that about 90% centers in Thane are offering pathology and USG. The centers for imaging are comparatively much lesser. There is a huge demand for imaging but only a few centers are catering to those needs. Most of these centers are clustered in one area hence the need for more centers arises in different areas.

The Patients prefer the centers providing multiple services under one roof so that all the tests can be done at one place. The services fetching the maximum no of patients are the pathological services, USG, and X-ray's.

Nearly 20% of the patients visiting the centre are from small villages around Thane as the quality of health care is very poor there. So Thane is becoming the hub for diagnostic for the areas north and south of Thane.

Quality can be an issue for concern as most of the diagnostic centers are not ISO and NABL approved. The personal interviews revealed that not many of the diagnostic centers were interested in even having it near future.

Another important finding is that 30% of the radiologist is planning to upgrade their set up by installing CT scan and MRI's. The current trend followed by 80% centers having imaging is to use re-furbished machines.

The centers proving add on services like home /office sample collection, online report delivery have a greater in flow of patients. The latest trend being followed is to provide ambulance service and centers are also trying to make their centers run 24 hours.

Diagnostic centers have many tie up with hospitals to have a good foot fall of patients. Now day many diagnostic centers are also having tie-ups with the IT companies and insurance company for services like pre-employment checkups and pre insurance checkups.

Most of the centers have 95% permanent doctors only 5% of them are visiting facilities and they are given commission per patient.

95% of the diagnostic centers are doing no marketing for promoting their centers. Except for some who market them self's at conferences and medical journals.

With time there has been advancement in the reporting system, most of the centers are having computerized or digitalized reporting system. Tele radiography is also becoming popular. One of the centers has also installed pacs.

17. <u>**Conclusion**</u>

The field of Diagnostic centers has a huge scope to grow in Thane. There are many successfully running centers already present with many different services. Most of the chain diagnostic has very well penetrated the market too. Even then there is a huge need gap for advanced imaging services. Further due to the exponentially growing population this need gap will also keep increasing in future. Hence arises the need to set up many new diagnostics centers in the city. The most preferable location for the setup of new centre according to the location analysis is the southern periphery region of Thane, i.e., around the golf course extension road.

The level of completion faced will be very high as most of the major competitors have very old setups. The chain diagnostics have penetrated the market very well leaving very narrow scope of growth. Hence excellent marketing scheme and new and innovative ideas will be needed to compete and stand out in the existing market. Best quality, minimum price, quick service, additional comfort services for patients and all services under one roof could be the best way to move ahead. The centre must have all high end imaging services, pathology test: routine and special tests, should encourage preventive check up and last but not the least indulge into clinical trials in a big way as in near future India is going to the hub for clinical trials.

It should be kept in mind starting a new set of Diagnostic services involves huge investments of finances, time, manpower and a lot of patience as the return on the investments will not be very fast. From our survey ROI can take a time of 3 to 5 years depending on the business model being followed. An approximate investment of Rs 4 cr. will be needed to start up a facility the total budget will be approximately 10 cr. Profit after tax in 5 years will be of 11crs.

The three months that I spent at Healthsprint has been very enriching experience and it helped me to gain valuable insights in the field of diagnostics. The fact that a lot of my work was out in the field and not restricted to sitting in an office is probably the strongest contributor to my learning in this project. It helped gave me a chance to speak to many learned people. This project also gave me an opportunity to learn new things like feasibility study, location analysis, strategic planning, developing the budget etc. Overall, this three months long internship was a very enlightening and enriching learning experience for a fresher like me.

18. **Future of Diagnostics**

This is one of the areas where the spread of technology is the most rapid. Any fore casting may be incorrect but what is certain is that major advancement which is beyond imagination today will appear in near future. The CT scan and MRI will reach the phase of maturity. The unit cost of these procedures will also drop and these services will be very wide spread. Processing of image will improve and the appliances will become small and more widely available.

Digitalization of imaging will lead to disappearance of films as the resolution on screen and paper improves. This will also permit networks for transmitting images within the hospital and between hospitals and external practitioners. Invasive radiology will continue to develop and become more popular like: intra luminal dilatation, transceutanious biopsies, chemonucleolysis, catheterization and embolisation, drug delivery to specific sites etc.

Automation of surgeries under radiological surveillance has prospects which are full of promises and difficult to imagine. The road ahead for diagnostic centers is very bright especially if the latest trends in the market will be followed.

India will be the hub for Clinical trials by 2010, global pharma majors would spend around $1-1.5 billion just for drug trials in the country as India has a vast, unwieldy population, a plethora of diseases, and rampant poverty which has forced almost all the top names in the pharmaceutical world to zeroed-in on India for conducting clinical trials and these trials are now being out sourced to standalone diagnostic centers hence it is one of the biggest development in this field.

Going paper less: this is the latest trend in health care industry to go paper less by using high end information technology like PACS for imaging, mobile app in I-phone and android phones for viewing the digital images anytime anywhere. The patients are given I cards which will have a chip that will contain all the old information about that person.

19. **Research limitations**

Some difficulties were faced during the course of the internship, which caused some limitations in the project.

- Some of the diagnostic centres were reluctant in sharing information about their centre as they had a busy schedule and for fear of misuse of data.
- Many of the big diagnostic chains, which were contacted, did not even give appointments.
- Limited number of patients was interviewed. The reasons behind this being the unwillingness of patients to take part in the survey, and the staff of the diagnostic centre not allowing to interview patients.
- Lack of time: The time period of three months is not enough to know whole behavioural patterns of the complete market. More time is required to do a more extensive study to come up with better interpretations and solutions. All the suggestions given in this report are based on the survey done in these three months. One can come up with more alternatives if the number of people surveyed and the time period for carrying out the survey is more.
- Lack of qualified doctors: Some of the doctors who underwent the survey were less aware about the market trends.

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21. Annexure

Questionnare

Name of the facility:
Location/address/ph. No.:

Type of institute: Pvt. Public Pvt Ltd Trust Charitable
Type of services:
Name of the person interviewed:
Designation of the person interviewed:
Area (in sq. ft.):

1. **What kind of patients do you receive?**
   a. Socio – economic status

Poor	Middle Class	Rich

   b. Purpose

Diagnostic	For health check up	For preventive packages	Clinical Trials	Control program (diabetes, obesity)

   c. Referral Pattern

Walk in	Corporate client	TPA/Insurance	Referral	
			(a) Hospital	
			(b) Doctor	
			(c) Family/Friend	

2. **What type of services do you provide?**
   a. Pathology: (Present/Absent/Proposed)

	Clinical Biochemistry	Clinical Pathology	Cytopathology	Hematology	Histopathology	Immunology	Microbiology
P							
A							
Pr							

b. Special tests:

Names	Machines	Manual	Pricing

c. Radiology:

S. No.	Service	Present	Absent	Under development
i.	X-ray			
ii.	Endoscopy			
iii.	USG			
iv.	Bone densitometry			
v.	Doppler Ultrasound			
vi.	Special tests			
vii.	Echo Cardiograph			
viii.	Fluoroscopy			
ix.	Mammography			
x.	C-arm			
xi.	Angiography			
xii.	MRI SCAN			
xiii.	CT SCAN			
xiv.	Digital Cardiac Cath Lab			
xv.	PET SCAN			
xvi.	Nuclear imaging			

3. HR details:

Designation	Number	Amount/ % spent
a. Clinical		
• **Sr. Technicians**		
• **Jr. Technicians**		
• **Doctors**		
b. Administration		
• **CEO**		
• **Administrator**		
• **Clerical staff**		
• **Supportive staff**		

4. Number of people you get per day?

Particulars	Number	Avg.	Income	Level of technology

	Machines	Patients	tariff	range	
Lab diagnostics					**Fully automatic Semi automatic Manual**
X-ray					**500mA 1000mA**
USG					**Color Spectral Computer enhanced**
Echocardiogram					**2D 3D 4D**
ECG					
CT					**4 Slice 16 Slice 64 Slice 256 Slice 320 Slice**
MRI					**1.5 Tesla 3 Tesla 5 Tesla 7 Tesla 9.4 Tesla**
Endoscopy					
Nuclear Imaging					**Single headed gamma camera Dual head gamma camera Scanning gamma camera PET Scan**
Angiography					
Mammography					
Bone Densitometry					
Special tests					
TMT					
Branch 1					
Branch 2					
Branch 3					
Total number of registration					

5. **Add-on services provided:**

- ☐ Home/office sample collection
- ☐ Online report delivery
- ☐ Ambulatory service
- ☐ 24 hrs imaging services

6. **What percentage of your budget is spent on**

Particulars	Maintenance	Overheads	Materials	Construction	Equip.
Expenses	**AMC**	**Power**			
	CMC	**Water**			
		Rent/Land			

7. Percentage of revenue earned from

Dept.	Pathology	Immunology	Radiology	Imaging	Endoscopy	Preventive check up	Pre-insurance check up	Corporate plans
Income								

8. Availability of technicians and doctors; number.

- Permanent ________________ Visiting ______________ Outsourced _______

9. Revenue distribution to doctors:

- Fixed + incentives
- Commission per patient
- Hourly basis
- Percentage according to test

10. Criteria followed for up gradation:

- Increase in demand
- Requirement by doctors
- Requirement by patients
- Competition
- Others _______

11. Are there any services you outsource?

- Special tests Cafeteria Laundry Imaging services
- Back office services Call center Reporting

12. Do you have any expansion plans in the pipeline? If yes, which kind?

- Expanding this place Opening at a new location
- Collection centers Sub centers Fully functional labs

13. What type of branches do you have? Number?

- Collection centers ______ Sub centers ______ Fully functional labs ________

14. Do you have any tie-ups with hospitals or doctors or diagnostic center?

- Yes No

15. What kind of marketing do you do?

a. Media – TV Radio Newspaper
b. Direct marketing (pamphlets)
c. Banners and hoardings
d. Telemarketing (Just dial)
e. Online marketing
f. Percentage of budget spent ___________

16. Where and how do you market yourself at:

- Hospitals
- Private practitioners
- Corporate clients

□ Insurance agencies/TPA

17. Are there any policies of sharing profits with the referrals? What percentage?

18. Reporting System

□ Digital Computerized Film Tele radiography PACS

□ Centralized Other __________

19. Information system used:

□ LIS ______ RIS _____ Equipment maintenance software ____ Other ________

20. What additional services are required in this area?

21. Quality parameters:

□ Accreditation o NABL o ISO

□ Equipment calibration o With whom ____________ o How often _________

22. Your opinion about the current market scenario (competition, medical tourism).

23. Your success story and future plans.

____

Questionnare (Consumer)

Age: < 18 yrs 18 – 30 yrs 30 – 45 yrs 45 yrs and above
Sex: M F
Location/address:
Profession:
Yearly income:

1. **When do you visit the facility?**
   a. Walk in
   b. Recommendation - Doctor Company Insurance/TPA
   c. Routinely
   d. Emergency
   e. Others _________

2. **Why do you visit the facility?**
   a. Ease of accessibility
   b. Affordability
   c. Availability of services
   d. Membership
   e. Recommendation
   f. For add-on services
   g. Quick service
   h. Others _________

3. **How would you rate the pricing?**
   a. Affordable
   b. Value for money
   c. Expensive
   d. Highly expensive

4. **How would you compare this facility to others that you have visited?**
   a. Worse
   b. At par
   c. Better

5. **Which other facilities would you like to go to?**

6. **Are there any services that you feel are not there/inadequate in your locality?**

7. **Any suggestions/ comments…**
   ………………………………………………………………………………………………………
   …