Assessment of Radiology Department Using Balance Scorecard

By

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Dissertation submitted for the partial fulfillment of the

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A Dissertation on

ASSSESMENT OF RADIOLOGY DEPARTMENT USING BALANCE SCORECARD

AT

NARAYANA MULTISPECIALITY HOSPITAL, JAIPUR

Under the guidance of

Brig.(Dr.) S. K. Puri,Professor , Hospital Management , IIHMR Jaipur

&

Mr Subhasis Bhattacharya, Deputy General Manager – Operations

Narayana Multispeciality Hospital , Jaipur

Submitted in fulfilment

Of

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By

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Institute of Health Management Research, Jaipur

INSTITUTE OF HEALTH
MANAGEMENT RESEARCH
(WHO Collaborating Centre for District Health System Based on Primary Health Care)

IIHMR UNIVERSITY

TO WHOMSOEVER MAY CONCERN

This is to certify that **Dr. Varsha Jamakhandi**, student of MBA Hospital and Health Management (MBAHM) from The IIHMR University, Jaipur has undergone internship training at **Narayana Multispeciality Hospital, Jaipur** from **6th February 2016** to **14 th May 2016.**

The Candidate has successfully carried out the study designated to her during internship training and her approach to the study has been sincere, scientific and analytical.

The Internship is in fulfillment of the course requirements.

I wish her all success in all her future endeavors.

Col(Dr) Ashok Kaushik
Dean, Academics and Student Affairs
The IIHMR University, Jaipur

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Multispeciality Hospital
Unit of Narayana Health

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The certificate is awarded to

Dr. Varsha Jamakhandi

In recognition of having successfully completed her

Internship in the department of

Operations

And has successfully completed her Project on

"Assessment of Radiology Department using Balanced Scorecard technique"

Date: 14th May 2016

Organisation : Narayana Multispeciality Hospital

He/ She comes across as a committed, sincere & diligent person who has a

Strong drive and zeal for learning

We wish him/her all the best for future endeavours

Deputy General Manager-Human Resources

THE IIHMR UNIVERSITY, JAIPUR

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **'Assessment of Radiology Department using Balance Scorecard Technique"** and submitted by Dr Varsha Jamakhandi under the supervision of Brig. (Dr) S K Puri (Rtd) for award of MBA in Hospital and Health Management of the University carried out during the period from 6th February 2016 to 14th May 2016 embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

Signature Varsha Dr Varsha

Acknowledgement:

My institute – Indian Institute of Health Management Research (IIHMR) , Jaipur deserves the foremost appreciation for providing me the opportunities to undertake my dissertation in Narayana Multispeciality Hospital, Jaipur. My sincere thanks to Dr Ashok Kaushik, Dean , IIHMR University and my internal guide Brig. (Dr.) S. K. Puri in completion of the dissertation and providing me valuable suggestions.

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I express my sincere appreciation of the help rendered by staff of Radiology Department. My data collection and learning would not be possible without their involvement.

The support and prayers of my friends and family members deserves special thanks, which always supported me throughout my life.

Dr Varsha Jamakhandi

Contents:

HOSPITAL' S PROFILE

Narayana Health (formerly known as **Narayana Hrudyalaya**) is a multi-specialty hospital chain in India, headquartered in Bengaluru.[

The company won the "Good Company" award for its quality, affordability and scale.[The business model of Narayana Health became a Global Healthcare and Harvard Business School case study.The hospital chain is among the largest telemedicine networks in the world

The group was founded in 2000 by Dr.Devi Prasad Shetty under the guidance of the Asian Heart Foundation. Today, it has 31 hospitals in 19 locations. In 2013, Narayana Hrudayalaya Pvt. Ltd. changed its brand name to Narayana Health. Dr.Devi Shetty is the chairman of the group. A Raghuvanshi is the Vice Chairman, MD & Group CEO.

The chain has 1500 full-time Doctors and 15,000 employees. An average of 150 surgeries are performed every day and an average of around 80,000 outpatients are seen every month.

Narayana Multispeciality Hospital, Jaipur is a multispeciality tertiary care hospital offering high quality affordable medical care to the people of Rajasthan and bordering states. It is the first hospital in Rajasthan to get Joint Commission International (JCI) accreditation for meeting the international benchmarks in healthcare. Key specialties offered include Cardiology & Cardiac surgery, Orthopedics, Neurology and Renal Sciences.

A leader in the field of Cardiac sciences, it performs complex congenital surgeries, Coronary bypass grafting with advanced techniques like Beating heart surgeries, Minimally Invasive Cardiac surgery and other valvular surgeries on adults and children. It is equipped with cardiac OTs, state-of-the-art Cathlabs, 3D mapping of Electrophysiology , Cardiac Intensive Unit and Coronary care unit.

NH Jaipur runs a very successful Renal Transplant Program and has a dialysis unit performing 1400 sessions per month. It also offers one of the most comprehensive Orthopedics services in the region including Bone & Joint Surgeries, Knee and Hip replacement s, Spine Surgery, Arthroscopy & Sports medicine. It also has the expertise and infrastructure to treat neurological conditions like Stroke, AVMs, Tumours, Epilepsy etc. It is leading centre for minimal Access Surgeries and Bariatric Surgery to treat metabolic disorders and weight loss.

It is a 290 bedded multispecialty tertiary care hospital, located at Pratap Nagar within a sprawling campus of 4.7 acres offering high quality affordable medical care to the people within Rajasthan and bordering states as well.

NH mission is to deliver high quality , affordable healthcare services to the broader population in India. Core values o f the group are represented by the acronym “iCare” , which encompasses Innovation and efficiency, Compassionate care, Accountability, Respect for all, and Excellence as a culture.

Preface

Every era presents unique challenges to healthcare organizations, and the start of the twenty-first century has been no different. Today there is unprecedented attention on the quality of health services. Never have healthcare practices been subject to so much public scrutiny, have providers been financially rewarded for complying with best practice standards, or have health insurers refused to pay for the care of patients who experience potentially avoidable complications. These developments are just a few of an ever-increasing number of reasons why quality management is strategically vital to the work of all healthcare professionals. The old ways of measuring and improving performance simply won't suffice; the issues are too complex, and the stakes are too high.

Measurement is only the first step in quality management. "The Balanced Scorecard-Measures that Drive Performance" . The Balanced Scorecard is used as the central organising framework for important managerial processes, individual and team goal setting, compensation, resource allocation, budgeting and planning, and strategic feedback and learning.

The balanced Scorecard translates an organization's mission and strategy into a comprehensive set of performance measures that provides the framework for a strategic measurement and management system.

ACRONYMS:

BSC: Balanced Scorecard

CT scan: Computerised Axial Tomography

EMG: Emergency

HIS: Hospital Information System

RIS: Radiology Information System

HRD: Human Resource department

HOD: Head of the Department

IBP: Internal Business Process

ICU: Intensive Care Unit

IPD: In patient Department

LAN: Local Area Network

PHC: Preventive Health Check up

MRI: Magnetic Resonance Imaging

MAMMO: Mammography

NA: Not Applicable

OPD: Outpatient department

USG: Ultrasonography

ROCE: Return of capital employed

PACS: Picture Archiving and Communications System

DEFINITIONS:

Balanced scorecard: The Balance scorecard translates an organisation's mission and strategy into comprehensive set of performance measures that provides the framework for a strategic measurement and management system

Customer Perspective: What are our customer segments and which key factors are to customer satisfaction? Identifying what customer value (personal attention, on time delivery, innovative products) is also part of the customer perspective. Organisations need to measure what customer's value because improving customer satisfaction and loyalty should result in improved financial performance.

Capital Employed: Capital Employed is the value of the assets that contribute to an organisations ability to generate revenue.

Costs: Economists define cost as the value of the resources used to produce something including a specific health service or set of service.

Direct cost: It refers to those costs that can specifically we traced or identified with the service being provided.

Employee retention: The percentage of key staff turnover.

Employee productivity: Total revenue or net profit is divided with number of employees.

Financial perspective: Financial performance measures are usually associated with profitability. Typical measure would include operating profit, return on assets and individual customer profit. Margins In order to achieve financial goal, organisations need to deliver services they fulfil their targeted customer's need.

Gross profit or profit before tax and interest: income minus cost except tax and interest.

Indirect cost: Often called, they are not directly traced to the individual services. Elements of such costs are general administration, security, taxes etc.

Internal business process: organisations need to identify the internal processes that have greatest impact on what customer's value. Once these critical processes are identified, organisations need to measure the key success factors for each process. Typical measures of the IBP word include quality, cost, time to market and response time.

Innovation and learning perspective: the learning and growth perspective attempt to identify the skills and tools needed to key internal processes. What training, support systems and working conditions do people in the organisation need in order to provide high quality customer service. Indicators such as employee skill level, training availability and employee satisfaction attempt to measure an organisation's ability to excel at key business processes.

Return on investment: a measure of the net income an organisation is able to earn with the total assets. Return on investment is calculated by dividing net profits after taxes by total assets.

Executive Summary:

INTRODUCTION:

Balance scorecard is a managerial technique to measure the performance of the organisation developed by Robert Kaplan (Harvard Business School) & David Norton (Balance scorecard collaborative) in 1990's.

The Balance scorecard translates an organisation's mission and strategy into comprehensive set of performance measures that provides the framework for a strategic measurement and management system. The Balance scorecard retains an emphasis on achieving financial objectives, but also includes the performance drivers of these financial objectives. The scorecard measures organisational performance across four balanced perspectives: Financial, Customers, Internal Business Processes, and Learning and Growth. The Balance Scorecard enables companies to track financial results while simultaneously monitoring progress in building the capabilities and acquiring the intangible assets they need for future growth.

The information age environment for both manufacturing and service organisations requires new capabilities for competitive success. The ability of the company to mobilize and exploit its intangible or invisible assets has become far more decisive than investing and managing physical, tangible assets. Intangible assets enable an organisation to:

- Develop customer relationships that retain the loyalty of existing customers and enable new customer segments and market areas to be served effectively and efficiently.
- Introduce innovative services desired by target customer segments.
- Produce customised services at low cost.
- Mobilise employee skills and motivation for continuous quality improvement in process capabilities, quality, and response times.

A Balance Scorecard should be used in different way to articulate the strategy of the business, and to help align individual, organisational and cross departmental initiatives to achieve a common goal. The four perspectives of the scorecard permit a balance between short and long term objectives, between outcomes desired and the performance drivers of those outcomes, and between harder objectives measures and softer, more subjective measures.

Objectives of the study:

- To study the work flow of the Radiology Department and its interdependence with Narayana Multispecialty hospital, Jaipur
- To apply balance score card technique to measure performance of Radiology Department across four perspectives viz.
    - Financial
    - Customer
    - Internal Business process
    - Learning and growth
- To identify the areas of improvement and develop recommendation in coordination with the organisation, for strengthening and improving the quality of the system.

Methodology of the study:

- To analyse customer / patient perception towards various components of care and support services like clinical care, quality of services, infrastructure.
- To analyse the employee satisfaction considering factors affecting performance of job responsibilities.
- To evaluate the Internal Business Process.
- To calculate the return on capital employed for radiology department.

Study Time:

The study is carried out in four months duration (February – May)

Study Instruments:

Quantitative data:

- Self administered questionnaire for patients
- Questionnaire for employee perspective

Qualitative data:

- Informal interviews for Internal Business Perspective
- Focused group discussion
- Observation

Sample Size:

Two hundred twenty five customers / patients, who either undergoing any investigations as an inpatient and outpatient are the part of sample size.

Study Location:

Radiology department of Narayana Multispecialty Hospital, Jaipur

Analysis plan:

Perspectives	Measures	Indicators
Financial perspective	Return on capital employed Or profit	Revenue- consumption
Patient perspective	Patient satisfaction	• Tangibility of the services • Responsiveness of the service providers • Courtesy of service providers • Competence of service providers • Communication skills of service providers • Reliability of services
Internal business process		• Waiting time: ➢ Reception counter ➢ For procedure ➢ For collection of reports • Availability of reports • Quality of films • Wastage of films • Errors or mistakes due to radiology department
Learning & growth	Employee satisfaction Employee retention	• Tangibility ➢ Infrastructure ➢ Job • Access • Responsiveness • Understanding the customer • Competence • Team work • Security • Communication • Performance appraisal • Employee Re-skilling • Percentage of staff turnover

Study limitations:

- Most of the information related to financial perspective was not available. So on the basis of apportionment the cost was calculated
- In customer perspective portable investigations were not taken into sample size. As portable was done mostly for ICU patients and they were not in a position to respond.
- Employee productivity calculation was not possible as the organisation did not provide the net profit amount of Radiology

Linking balanced scorecard components for Radiology Department

Perspective	Indicators
Financial	Net increase in revenue Return on investment
Customers	Customer satisfaction Key areas of improvement • Availability of reports • Waiting time • Cost to quality • RIS
Internal business process	Percentage of reports generated on stipulated time Quality of films Wastage of films PACS Equipment breakdown
Learning and growth	Employee satisfaction Employee retention

Recommendations:

- Provision of PACS server interfacing with HIS will ease the process.
  - On line entry of investigation requests and their results/ reports
  - Retrieval of information on patient and investigation results
  - On time service with no delay in the process flow
  - Reduction in clerical work
  - Periodic equipment statistics(uptime , down time etc)
  - Daily/ monthly performance reports
  - Improved inventory analysis
  - Continuous monitoring
- Proper scheduling and shifting of In patients would reduce the on call charges
- Appointment system for both IPD and OPD patients

- Align personal goals for the employees
- Rotation of staff in radiology department
- Broadening of skills by proper training to attain quality output (both in conducting procedures and communication)
- Improve air quality to reduce breakdown of equipments

The above proposed activity will help the organisation in developing customer relationship so as to optimize revenue and profits by increasing

- Customer/ Patient satisfaction
- Customer/ Patient loyalty
- Customer/ Patient Retention
- Customer/ Patient Growth.

Chapter – One

INTRODUCTION TO THE STUDY

Healthcare is a commodity that most people will need at some time in their lives. The role of physicians, hospitals, insurers, and advocacy groups is fast becoming a melting pot of diverging needs. The Joint Commission states that "healthcare is characterized by economic competition, resource limitations, and new delivery sites—a significant proportion of which are not subject to external surveillance" (Joint Commission on Accreditation of Healthcare Organizations, 1990, p.7).

Quality means different things to different people. Some consumers think that getting quality health care means seeing the doctor right away, being treated courteously by the doctor or hospital staff, or having the doctor spend a lot of time with the patient and his family.

While we, as a hospital, understand and agree that these things are very important, we believe clinical quality of care is even more significant. Why? Because offering high-quality, evidence-based care (care that is proven) leads to more lives saved and less time in the hospital.

Health care quality by six attributes:

- Safety - patients should not be harmed by the care that is intended to help them
- Patient-Centred - care should be based on individual needs
- Timely - waits and delays in care should be reduced
- Effective - care should be evidence-based
- Efficient - reduce waste
- Equitable - care should be equal for all people

Another way of looking at this would be to say that the organisation performance as a hospital is governed by the quality of its processes – high quality process delivers high quality service, at the lowest possible cost and on time

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progress in building the capabilities and acquiring the intangible assets they need for future growth.

The information age environment for both manufacturing and service organisations requires new capabilities for competitive success. The ability of the company to mobilize and exploit its intangible or invisible assets has become far more decisive than investing and managing physical, tangible assets. Intangible assets enable an organisation to:

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- Introduce innovative services desired by target customer segments.
- Produce customised services at low cost.
- Mobilise employee skills and motivation for continuous quality improvement in process capabilities, quality, and response times.

Financial Perspective:

Financial performance measures indicates whether a company's strategy, implementation and execution are contributing to bottom line improvement. Financial objectives typically relate to profitability measured in terms of operating income, return on capital employed, sales growth or generation of cash flows.

Customer perspective:

In customer perspective of BSC, managers identify the customer and market segments in which the business unit will compete which is measured in targeted segments. This perspective typically includes several core measures of the successful outcomes from a well formulated and implemented strategy. The core outcome measures include customer satisfaction, customer retention, new customer acquisition, customer profitability, and market and account share in targeted segments. This perspective enables business unit managers to articulate the customer and market based strategy that will deliver superior future financial returns.

Internal business process perspective:

In the Internal business process perspective, executives identify the critical internal processes in which the organisation must excel. These processes enable the business unit to:

- Deliver the value propositions that will attract and retain customers in targeted market segments
- Satisfy shareholder expectations off excellent financial returns.

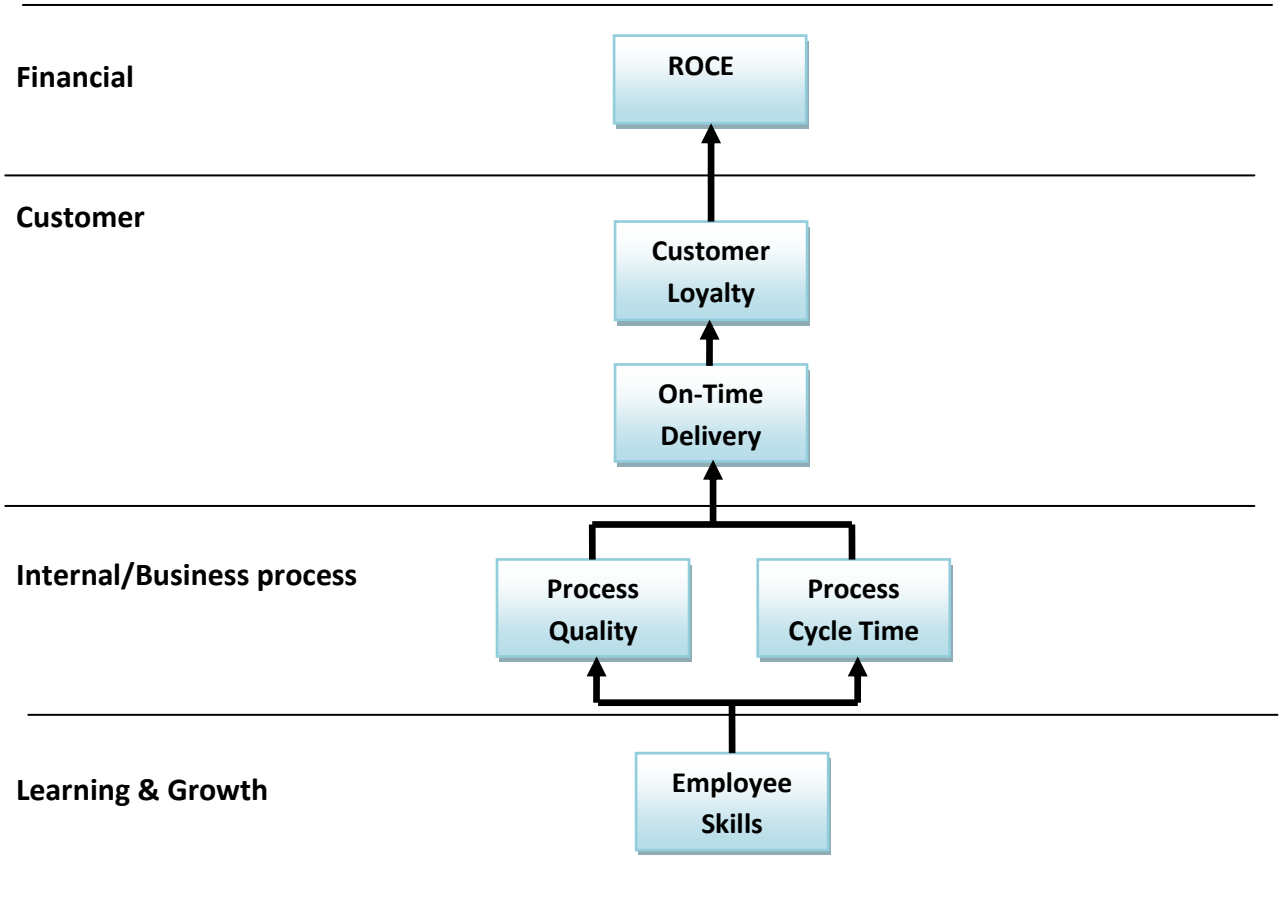
The Internal business process perspective incorporates objectives and measures for both the lonfg wave innovation cycle as well as short wave operation cycle.

Learning and Growth perspective:

The Learning and Growth perspective identifies the infrastructure that the organisation must build to create long term growth and improvement. Organisational Learning and Growth comes from three principle sources: People , System and Organisational procedures.

The Financial, customer and internal business process objectives on the BSC reveals large gaps between existing capabilities of people , systems, and procedures which are required to achieve breakthrough performance. To close these gaps businesses will have to invest in reskilling employees, enhancing information technology and systems and aligning organisational procedures and routines.

CAUSE AND EFFECT RELATIONSHIPS:



RATIONALE OF THE STUDY:

Healthcare organisations are getting concerned about the quality of care provided and recognise where and how healthcare adds value. Hospital care is complex. It involves providing quality care to patients with a wide range of illnesses and injuries and differing expectations and needs. It also includes the service functions of waiting time, process cycle on time, staff behaviour etc. Now the hospitals want to increase the efficiency, so they identify the areas, which can bring about the change. So, to connect the practices, outcome, quality, value and costs, healthcare organisations could use Balanced Scorecard. It retains an emphasis on achieving financial objectives, but also includes the performance drivers of these financial objectives. The scorecard measures organisation performance and reveals the interdependency across four perspective: Financial, Patient, Internal Business Processes and Learning and growth (Harvard Business Review)

Literature Review:

Quality has been a central focus in health care organisation. Every organisation recognises the importance of measuring as well as providing the achievement of the organisations strategies.

According to Gemmelepal who survive in the next decade it is very important for hospital managers to better manage their resources, whereby attention will focus on the issues of quality management and concepts of improving effectiveness of service delivery.

Balanced score card concept mainly depends on improving the quality of internal process as per requirements of, patients and validates the process as per their expectations the services.

In balanced score card Robert Kaplan and David Norton tell the story of how the CEO of an under seas construction company guided senior managers to develop an explicit mission statement. This process lasted several months after which the mission statement was distributed throughout the company. Soon thereafter, the CEO received a phone call from a manager on drilling platform in North Sea. The manager said. “I want you to know that I believe in the mission statement. I want to act in accordance with the mission statement. I am here with a customer. What am I supposed to do? How should I behave each day, over the life of the project, to deliver our mission statement? ” In this company, there was clearly disconnect between the words in the mission statement and the actions required to implement them on a day today basis. Kaplan & Norton suggest that this common problem in business world, and the proposed the balanced score card as a means of linking strategic objectives with the day today activity.

Case studies:

Duke children’s Hospital

In 1996 Duke Children’s hospital in Durham, NC was in trouble. The hospital has incurred dollar 11 million loss, and shortly thereafter , essential products, programs and services were at risk of elimination.

It didn’t make sense; we couldn’t allow these programs and services to tank, “recalls chief medical director Dr John Mellones. We had to figure out a better way to handle the business of medicine. But the nurse and doctors, concerned with patient care, were not focused on business matters. On

the other hand, the business managers felt they had no control over costs. Yet they certainly couldn't tell care givers to stop ordering tests."

So Mellones created a balanced scorecard tool. Mellones initial system solved many customers' satisfaction problems for Duke Children's hospital. The system tracked patient's treatment history and cost for medication, equipment and surgery. It tracked waiting times, medical errors, patient satisfaction information collected from surveys filled out by parents, and other data. As a result the percentage of patient's satisfactions rose for 48 to 90 percent. The scorecard also helped the hospital staff find ways to reduce expenses without reducing patient satisfaction.

"I looked at the three key cost drivers in the score card and found that there were length of patient stay , drug administrated and lab tests", Mellones recalls . He recruited other doctors to review the entire lab test and medications they had prescribed that year, and then compare them to national averages. They found tests and medications that were unnecessary, or for which there were less expensive alternatives.

Within six months the Duke Children's hospitals scorecard helped the PICU (paediatric Intensive Care Unit) reduce its cost per case by 12 percent. While at the same time, boosting customer satisfaction by 8 percent.

Peel Memorial Hospital:

Peel memorial hospital, Vancouver, BC that focuses the balanced scorecard as "the balanced scorecard is specially provide us with a framework for performance measurement and evaluation which translates organisations strategic objective into coherent set of performance measures to achieve the goals.

The effective assessment was needed to see the connection between the past, present and future, so they implemented balanced scorecard for two years. It benefitted the hospital in many ways such as

- Patient satisfaction levis have been increased from 85% to 95%
- Employee satisfaction survey levels have tremendously rose to 75% from 33%
  As a result it enabled hospital to align funding to improve the skills of employees'

Objectives of study:

Broad objective:

To assess the overall existing performance of Radiology Department and to develop initiatives for achieving future competitive success.

Specific objectives:

- To study the work flow of the Radiology Department and its interdependence with Narayana Multispecialty hospital, Jaipur
- To apply balance score card technique to measure performance of Radiology Department across four perspectives viz.
  - Financial

- Customer
- Internal Business process
- Learning and growth

- To identify the areas of improvement and develop recommendation in coordination with the organisation, for strengthening and improving the quality of the system.

Methodology:

The study is descriptive and exploratory in nature. A comprehensive study has been conducted to measure the performance and perception across the four perspectives of balanced scorecard.

Financial perspective:

To calculate the revenue generated and consumption cost of the radiology department and also measure machine utilisation.

Customer / Patient perspective:

To analyse Customer / Patient perception towards various components of care and support services availing from radiology department.

Internal business process:

Internal business process measures focus on the internal processes that will have greater impact on customer satisfaction and achieving a financial objective. The Radiology department has their quality control measure, which are taken as a standard to compare the results.

The following indicators are taken into consideration for measuring internal business process:

1. Waiting time
   Reception counter
   For procedure
   For report collection
2. Availability of reports
3. Wastage of films
4. Errors or mistakes such as redoes
5. Maintaining TAT for emergency patients and Critical value reporting.

Learning and growth perspective:

To assess the overall satisfaction level considering factors affecting performance of job responsibilities of all the health care providers engaged in the radiology department.

Study time:

The study is carried out in three months (Feb – April)

Study instruments:

The following tools are used to gather information to get in depth understanding

Quantitative data:

- Self administered questionnaire for patients
- Questionnaire for employee perspective

Qualitative data:

- Informal interviews for Internal Business Perspective
- Focused group discussion
- Observation

Sample size:

Customer / Patients perspective:

SAMPLE SIZE

Two hundred twenty five customer / patients, who either undergone any investigations as an inpatient and outpatient are the part of sample size.

INVESTIGATION	SAMPLE SIZE
X- RAY	45
MAMMOGRAPHY	45
CT SCAN	45
MRI	45
USG	45

Time duration: 15 days

No of interview conducted per day = 15

Total sample size= 15*15 = 225

*For each investigation forty five cases were taken.

Learning and growth perspective

Employee's perspective:

Sample size: forty employees of radiology department were taken according to the designation wise.

Designation wise distribution of samples:

DISTRIBUTION	NO OF EMPLOYEES	NO OF SAMPLES
Consultants	4	3
Administrator	2	2
Technicians	11	11
Front office staff	3	3
Typist	3	3
CCA	2	2

Internal business process:

Waiting time

Sample size: Ten percent of total footfalls of patient in radiology department.

Study location:

The study was conducted at Narayana Multispecialty Hospital Jaipur in Radiology department. The department is located on the lower ground floor of the hospital. The department deals with the diagnosis of disease through the use of fluoroscopy, X-ray, Ultrasound (USG) , CT Scan and MRI.

Three kinds of patients comes the radiology department for investigations, viz., emergency patients, out patients and in patients.

Outpatient services functions from 9 am to 6 pm, while emergency service are available 24 hours.

Radiology department also caters the services to people coming for Preventive Health Check-up. PHC has being one of the major sources of revenue generation and increases the asset utilisation.

The following investigations are carried out:

- X-Ray
- Ultrasonography
- CT scan
- MRI
- Mammography

Inpatients are given priority over outpatients for investigations. There is a common counter for radiology department except for ultrasound, which is right in front of USG room. The patients report at the respective investigation room. Each unit in the

department is consists of separate reception, waiting area, equipment room along with facility of change room. There is a common typing pool for X-ray and CT scan. But for MRI and USG there is separate typing pool. The radiology reception also functions as a centralised dispatch counter from where the patients collect their reports. The organisation has defined a time frame for reporting the radiology results. It is as follows:

X-RAY:

- Wards, Emergency & OPD - Films will be collected between 9 am to 10 am .Reports will be dispatched at 12:00pm
- PHC: Films will be brought along with PHC patients - Within an Hour
- Critical Areas : Films will be collected between 11 am to 12 pm. Report will be dispatched at 2:00pm

CT SCAN:

- Investigation done before 2:00pm-Report will be dispatched at 6:00pm
- Investigation done after 2:00pm – Report will be dispatched on next day 12:00pm

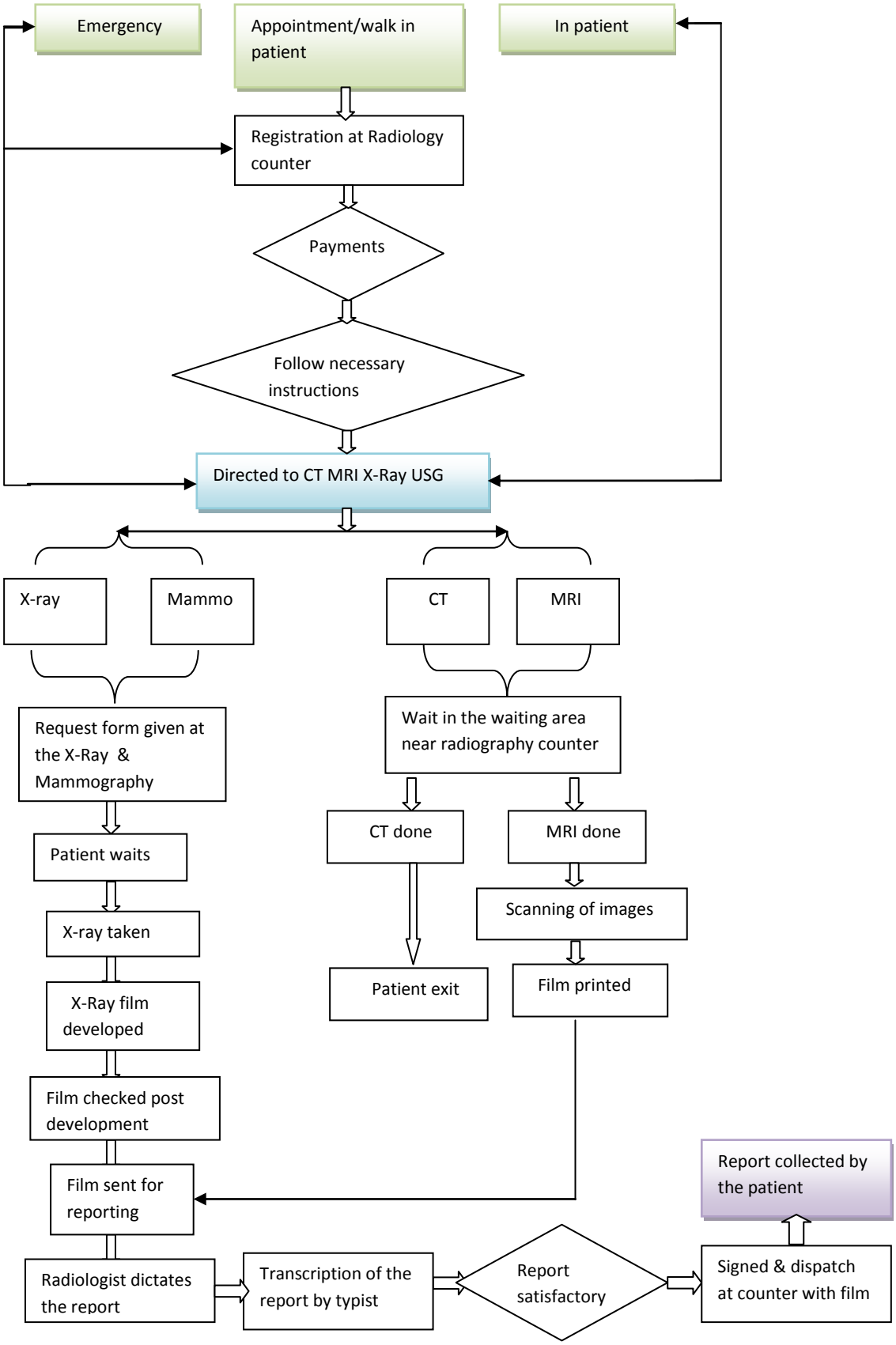
MRI:

- Investigation done before 2:00pm-Report will be dispatched at 6:00pm
- Investigation done after 2:00pm – Report will be dispatched on next day 12:00pm

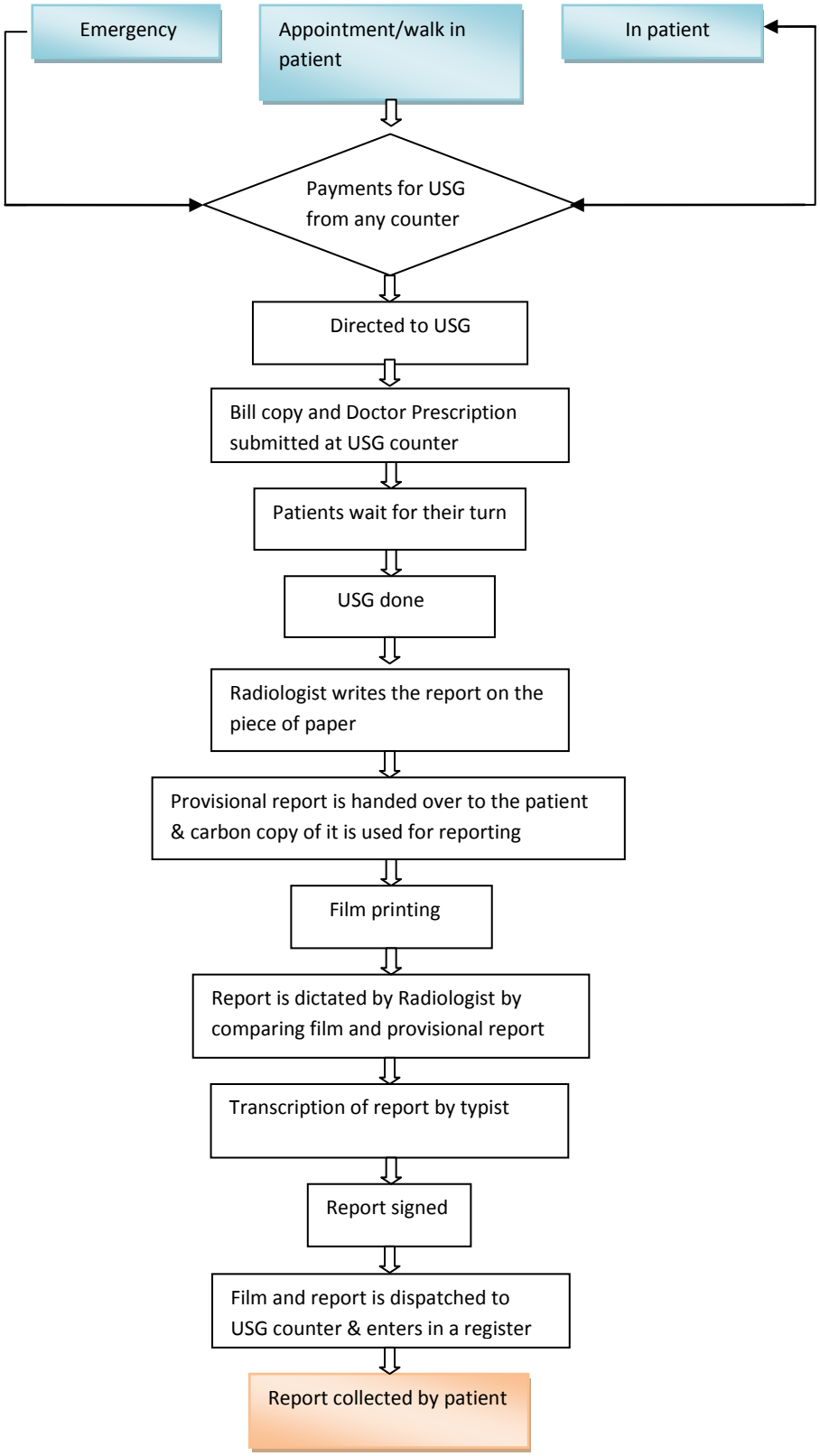
USG:

- Investigation done before 12:00pm – Reports will be dispatch at 2:00pm
- Investigation done between 12:00pm to 4:00pm – Report will be dispatch at 6:00pm.
- Investigation done after 4:00pm – Report will be dispatched on next day 2:00pm

Work Flow


Emergency
Appointment/walk in patient
In patient
Registration at Radiology counter
Payments
Follow necessary instructions
Directed to CT MRI X-Ray USG
X-ray
Mammo
CT
MRI
Request form given at the X-Ray & Mammography
Patient waits
X-ray taken
X-Ray film developed
Film checked post development
Film sent for reporting
Radiologist dictates the report
Transcription of the report by typist
Report satisfactory
Signed & dispatch at counter with film
Report collected by the patient
Wait in the waiting area near radiography counter
CT done
MRI done
Scanning of images
Patient exit
Film printed

USG Work flow



Study Limitations:

- Most of the information related to financial perspective was not available. So on the basis of apportionment the cost was calculated
- In customer perspective portable investigations were not taken into sample size. As portable was done mostly for ICU patients and they were not in a position to respond.

Chapter Two: FINDINGS OF THE STUDY

- Financial Perspective: The financial objectives serve as the focus for the objectives and measures in all the other scorecard perspectives. In present study Return on Investment for three months (only direct cost or consumption cost vs. Revenue) is being calculated. Following is the data of Radiology Department _Feb-April 2016

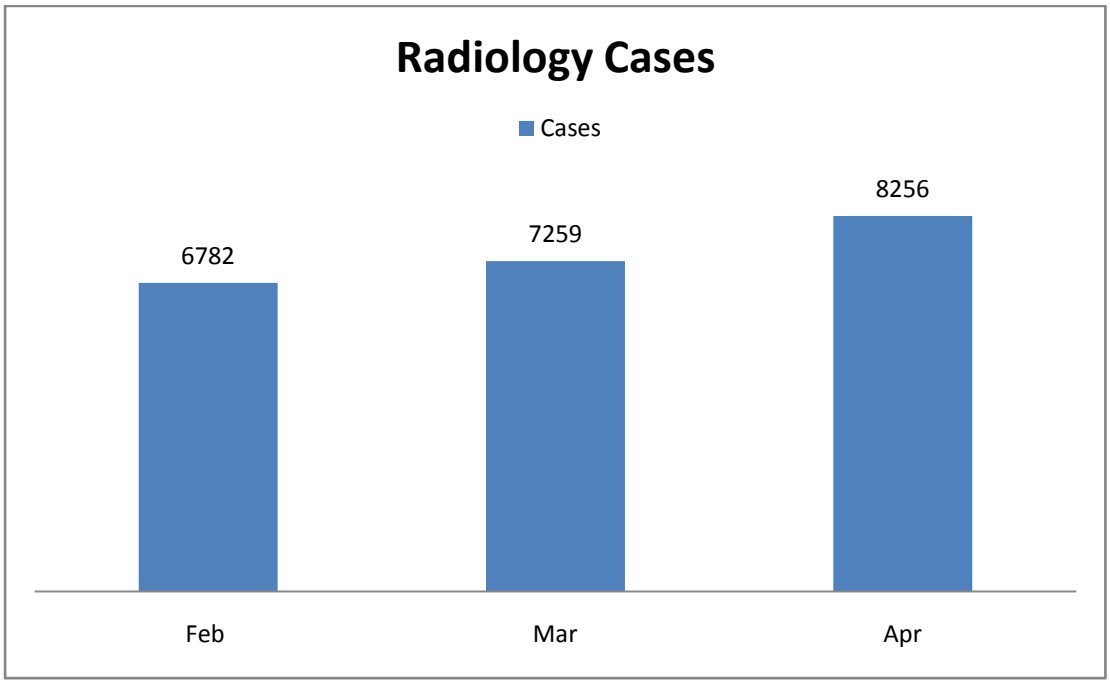
Month/Year	Feb-16			
Particulars	**X-ray**	**CT**	**MRI**	**USG**
No. of Procedures	3853	290	308	1491
No. of Films used	3380	790	1078	1400
No. of Waste Films	134			
Total Films Consumed	**6782**			
Benchmark	1.1	2.75	3.75	1.25
Benchmark of films	**4238.3**	**797.5**	**1155**	**1863.75**

Month/Year	Mar-16			
Particulars	**X-ray**	**CT**	**MRI**	**USG**
No. of Procedures	3395	432	106	1665
No. of Films used	3887	1250	357	1625
No. of Waste Films	140			
Total Films Consumed	**7259**			
Benchmark	1.1	2.75	3.75	1.25
Benchmark of films	**3734.5**	**1188**	**397.5**	**2081.25**

Month/Year	Apr-16			
Particulars	**Xray**	**CT**	**MRI**	**USG**
No. of Procedures	4573	361	301	1555
No. of Films used	4476	1050	1037	1500
No. of Waste Films	193			
Total Films Consumed	**8256**			
Benchmark	1.1	2.75	3.75	1.25
Benchmark of films	**5030.3**	**992.75**	**1128.75**	**1943.75**

Increase in radiology cases:

Graph 1-



Conclusion:

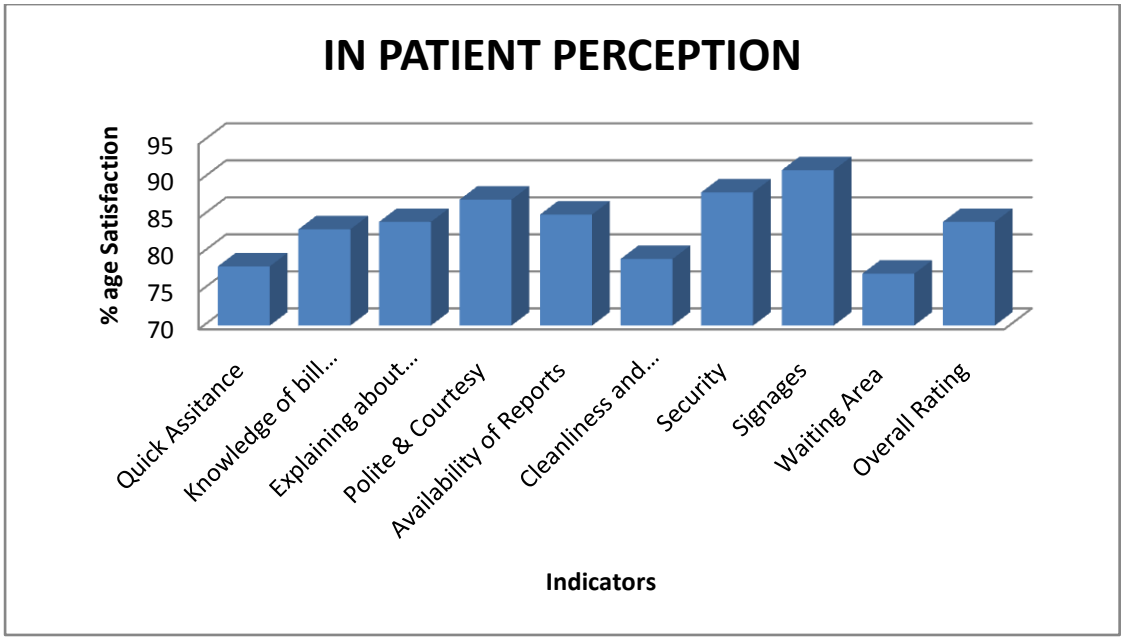
Financial objectives represent the long term goal of the organisation: to provide greater returns based on capital invested. So all these figures and information reveals radiology department is moving ahead to achieve its fundamental goals and objectives.

- Customer / Patients Perspective: Quality of acre from customer perspective is an important aspect in the development of healthcare services. By highlighting the patients as the primary customer / patients in a complex web of relationships, it is reaffirming that healthcare must be of the highest quality, as perceived by the patient.

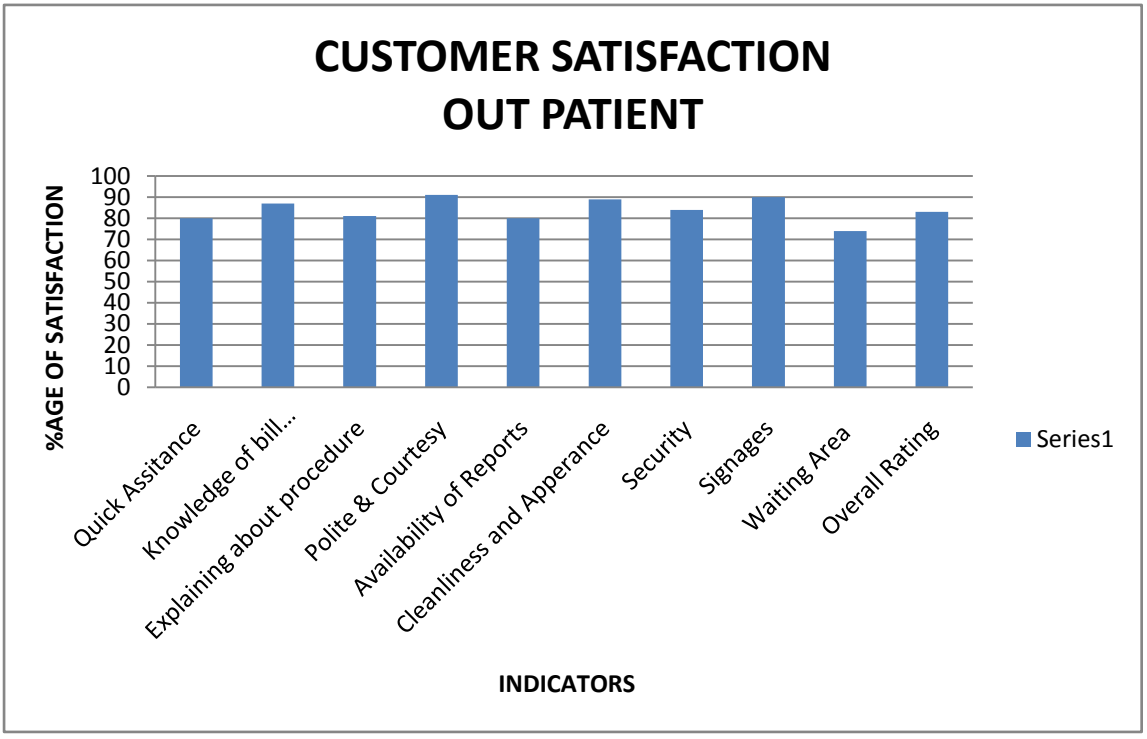
  Patient's perspective at radiology department:

  Narayana Multispecialty Hospitals provides an opportunity to improve quality and effectiveness of the services. It was measured for those patients who were undergoing any of the investigations (X ray, USG, MRI, CT scan) from the outpatients and Inpatients department.

Graph 2- In – Patient Perception

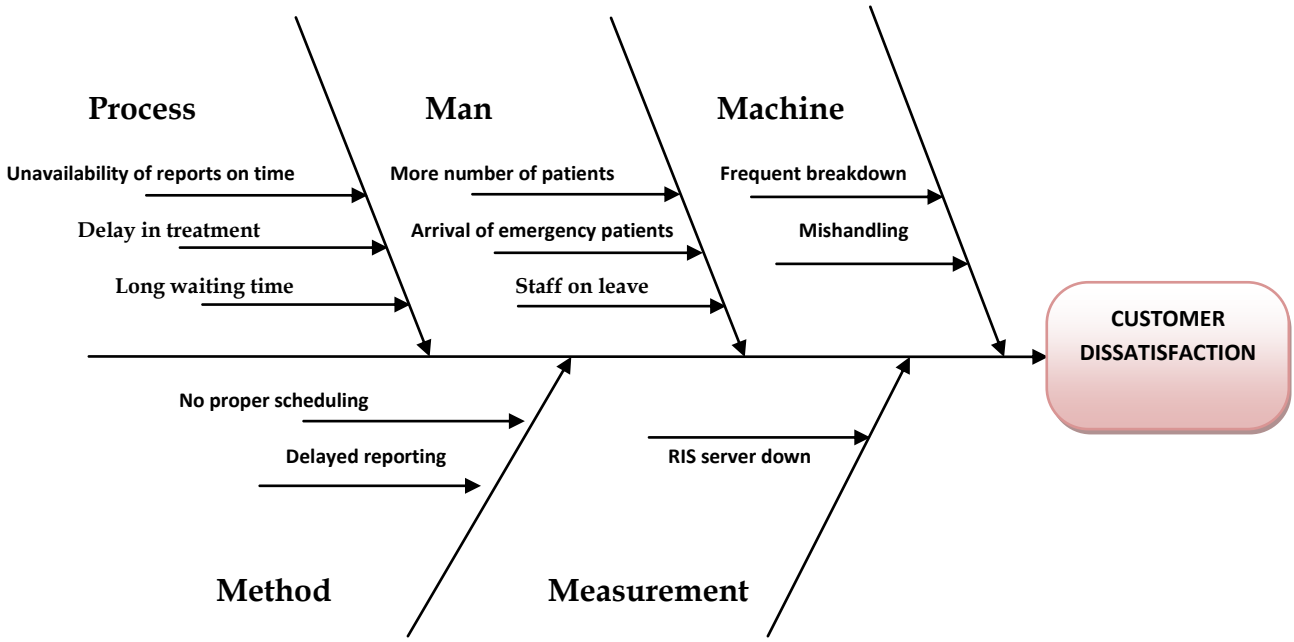


Graph 2: Out Patient Perception



A Cause and Effect Diagram To Identify All Possible Causes Of Patients Dissatisfaction:

FISH BONE ANALYSIS:



Conclusion:

This study has given us the clear picture about our image in the eyes of our customer/ patients. Therefore assessing patient perception has given us an important source of information for screening problems and developing an acceptable plan of action. The study brought out a variegated picture of the levels of expectations. Majority customer showed their dissatisfaction in relation to:

- Waiting time
- Availability of reports
- Accessibility of information

Internal Business Process Perspective:

For the IBP perspective, identify the processes that are most critical for achieving customer and shareholders objective. The radiology department has their quality plan for internal process. So these quality indicators are taken as measures for IBP.

Quality Plan for Radiology Department

S.No o	QUALITY CONTROL	QUALITY INDICATORS
1	Waiting Time ➢ At reception counter ➢ For procedure	 05 minutes 20 minutes

	➢ For collection of Reports	10 minutes
2	Wastage	Minimize wastage to 2%
3	Report within stipulated time • X- Ray: Wards, Emergency & OPD - Films will be collected between 9 am to 10 am Reports will be dispatched at 12:00pm • PHC: Films will be brought along with PHC patients - Within an Hour • Critical Areas : Films will be collected between 11 am to 12 pm ➢ Report will be dispatched at 2:00pm	All the reports should be ready for dispatch according to specific stipulated time for each investigation.
	• CT SCAN: Investigation done before 2:00pm-Report will be dispatched at 6:00pm Investigation done after 2:00pm – Report will be dispatched on next day 12:00pm.	
	• MRI: Investigation done before 2:00pm-Report will be dispatched at 6:00pm Investigation done after 2:00pm – Report will be dispatched on next day 12:00pm	
	• USG: Investigation done before 12:00pm – Reports will be dispatch at 2:00pm Investigation done between 12:00pm to 4:00pm – Report will be dispatch at 6:00pm. Investigation done after 4:00pm – Report will be dispatched on next day 2:00pm	

	Emergency TAT	30-40 minutes
	Critical Value reporting	5 minutes
	Error during report or procedure	It should be minimum or negligible.
	Machine Up time	Maintain air quality to reduce break down
	Use of films	Less than benchmark

1. Waiting Time:
   Waiting time is mapped into three distinct categories separately for all investigations:

- At reception counter
- For procedure
- For collection of report

Waiting Time for USG:

I (minute) – Time taken from registration of patient at USG counter to patient enter procedure room

II (minute) – Time taken for procedure

III(minute) – Time taken to provide provisional report after procedure

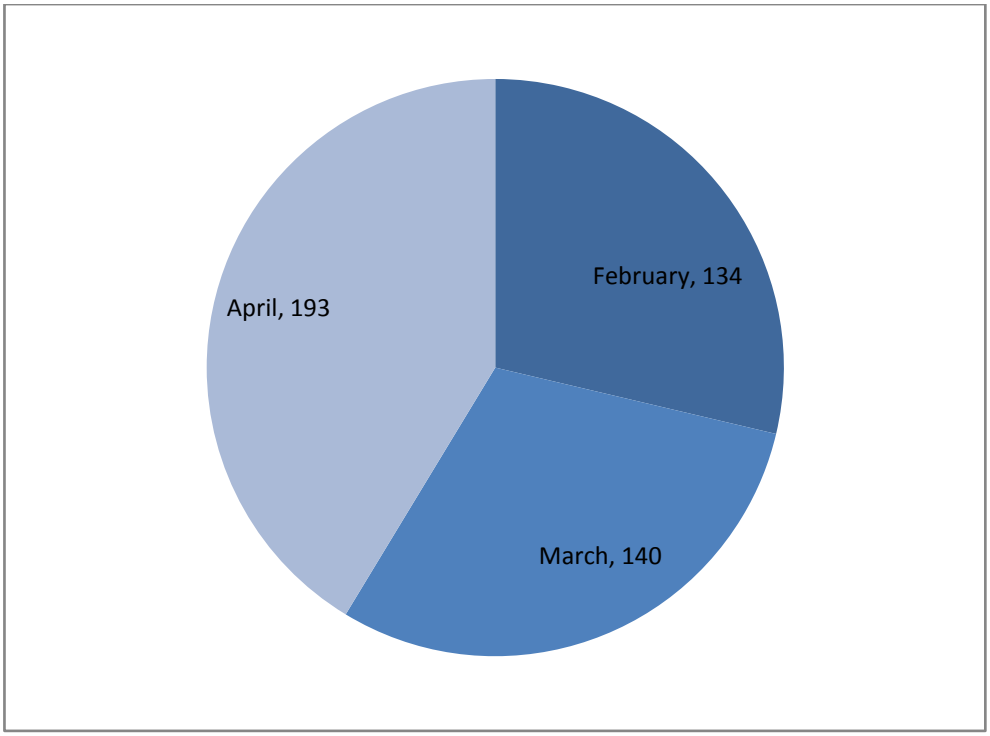
VI(minute) - Time taken to provide final report

Procedure	I min	II min	III min	IV min
X Ray	15 minutes	5 minutes	NA	15 minutes
CT Scan	45 minutes	20 minutes	NA	3 hours
MRI	1.5 hrs	40 minutes	NA	3 hours
USG	20 minutes	10 minutes	5 minutes	2.5hours

Reasons for long waiting time:

- No proper time scheduling for inpatient and outpatients.
- Due to walk in patient (no appointment) as a result there is long waiting queue.
- Sometimes the patients are not shifted timely from wards and OPD patients are not informed prior to investigation, which results in delays.
- Number of patients is more especially during the peak hours (11am – 2pm), which is also one of the reasons for delay.

WASTAGE OF FILMS:



Wastage of film is also very important factor, which can be minimised if our staffs is given proper training.

Process Failure in RADIOLOGY DEPARTMENT:

Quality of services is the utmost important for any business process. There has to be immediate response and negligible errors or mistakes in a process cycle. The major problems, which were identified, were:

- Reports / films not traceable or are missing
- Long waiting time
- Delay in procedure
- Error in typing
- Ineffective communication
- Exchange of bills and reports.

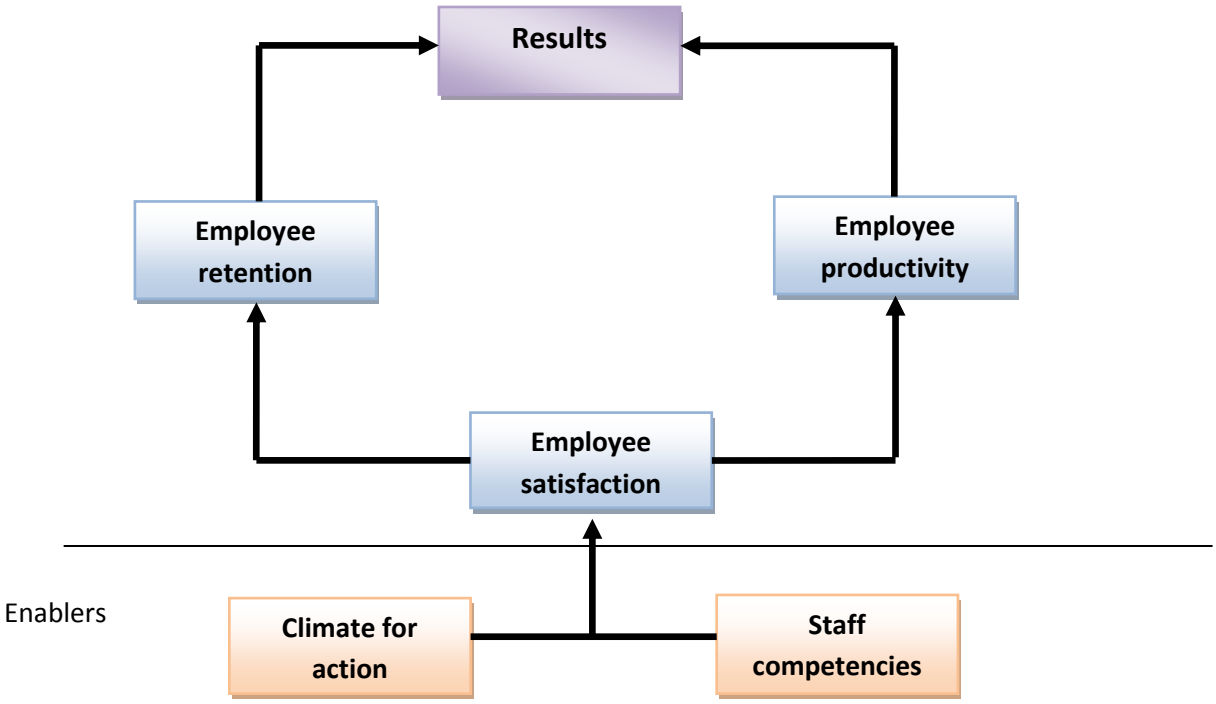
As a result of all these problems leads to patient dissatisfaction. So it is very essential to re-engineer process so as to reach the expectation level of the patients.

LEARNING AND GROWTH PERSPECTIVE:

The fourth and final perspective on the balanced scorecard develops objectives and measures to drive organisational learning and growth. Objectives in the learning and growth perspective are the drivers for achieving excellent outcomes in the efforts three scorecard perspectives. In healthcare organisation where “product” is intangible, employees carry high importance because they actually

produce and deliver the service to the customers. Special attention to care givers and service providers is one of the vital components of employee's satisfaction.

The Learning and Growth Measurement Framework:

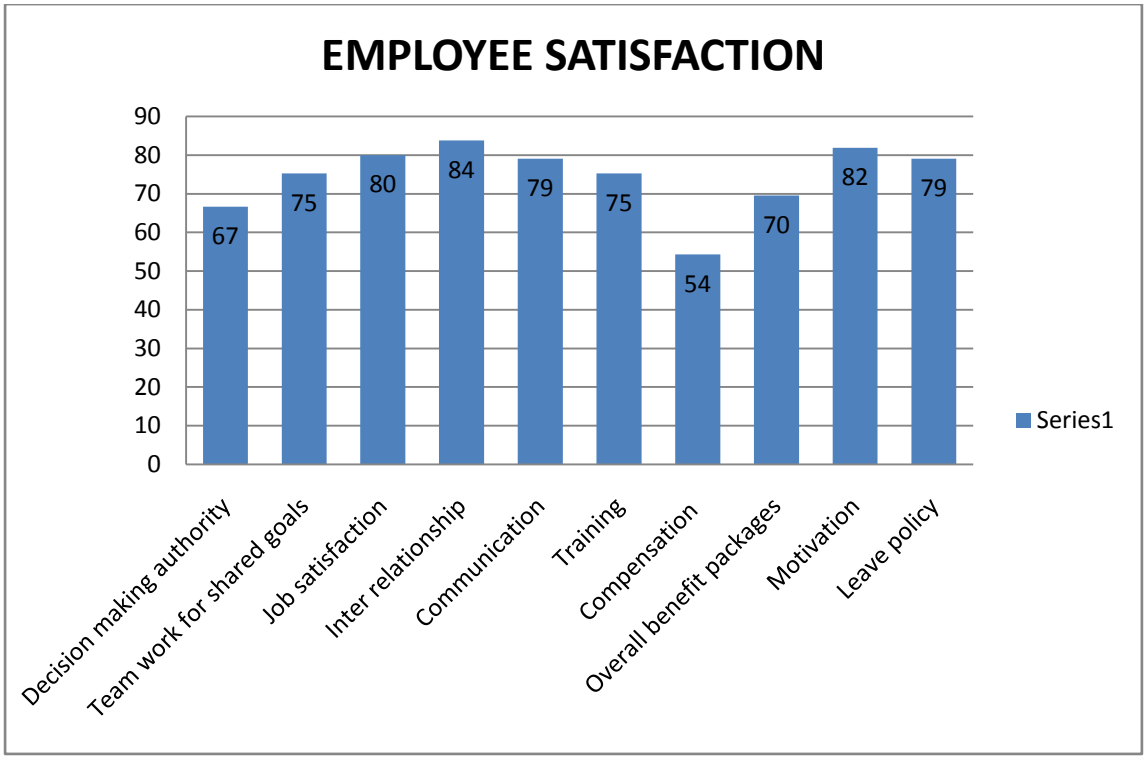


The three cores Employee Measurements are:

- Employee Satisfaction
- Employee Retention
- Employee Productivity
- Employee Re skilling

EMPLOYEE SATISFACTION:

Overall Employee Satisfaction = 74%



EMPLOYEE RETENTION (Feb – March 2016)

Percentage of Employee Turnover

No of Employees =25

No of Turnover of Staff= 0

Employee Retention= Exclusion *100

No of Employees

There was no turnover during this period.

RE- SKILLING THE EMPLOYEES:

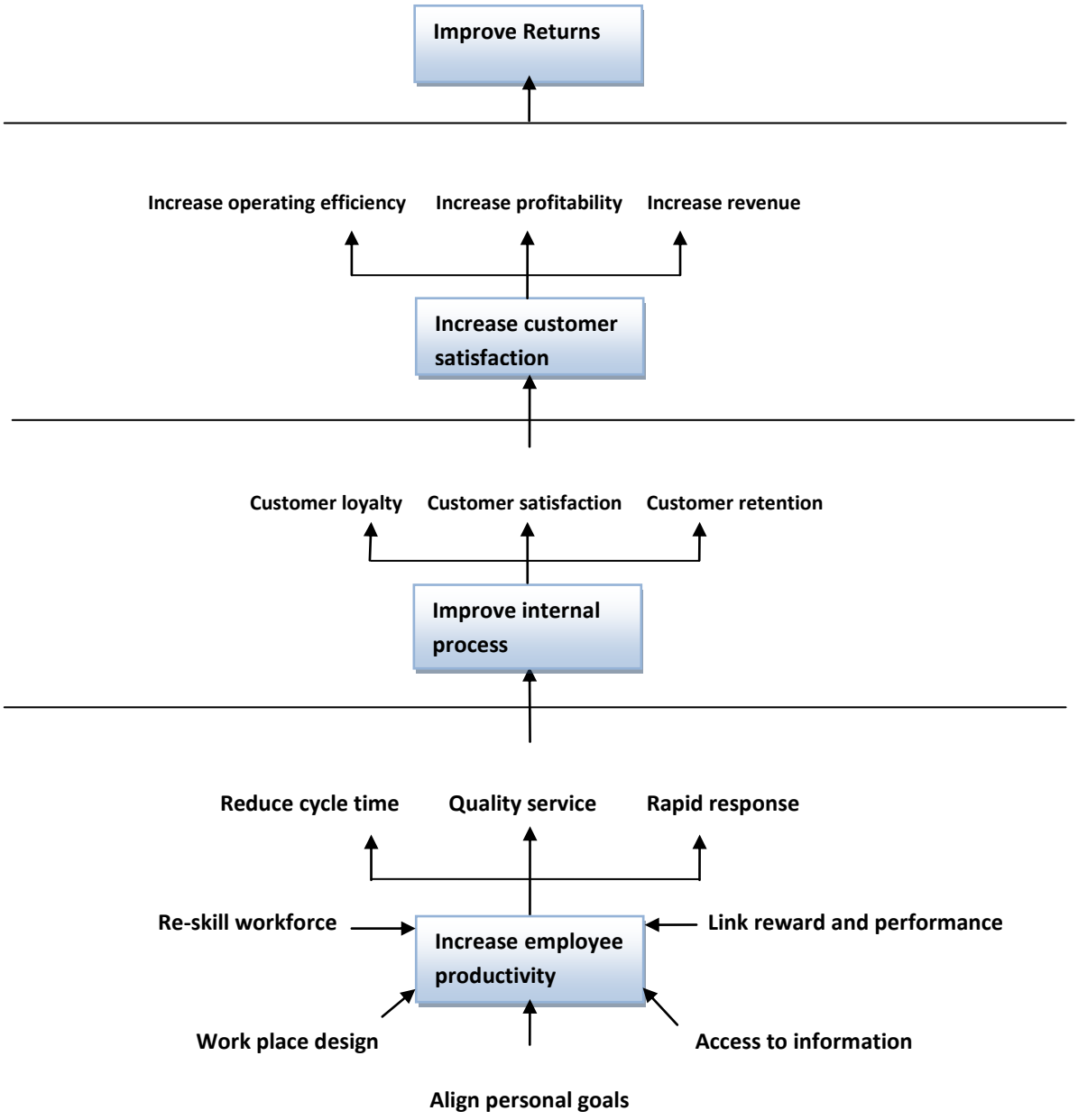
Only about 75% of employees are satisfied with present training program organised, and 85% of them shown their interest in attending the training programs related to technical skills, leadership, conflict management, computer skills etc.

Conclusion:

Satisfied employees are the backbone of an organisation. The overall satisfaction level of employees is 74%.

Chapter – Three: RECOMMENDATIONS

The linkage in the scorecard demonstrated a “hard” benefit (high return on capital employed) from improvements in “soft” measure (employee morale and customer satisfaction



PROPOSED ACTIVITY:

Goal reality:

- It is very essential for the organisation to clarify and translate departmental goals and targets to all the employees to make them aware of what is expected and their contribution in achieving them.
- Access to information relating to patient expectations
- Rotation of staff with in the sub units of Radiology department

LAN Connection:

- If there is proper LAN connection with PACS interfacing , the information will be available from billing to
  - Radiology counter
  - Investigation room
  - Typing pool
- System used by doctors in OPD should be given LAN connection and should be used by the doctors for ordering the tests and seeing reports online.
- Token system can be used for proper scheduling especially in X Ray department.
- Consultants should order test through HINAI for both Inpatient and Outpatient , which would help in reducing the procedures conducted off hours due to negligence of staff in shifting patients during working hours.

Broadening of Skills:

- Broadening of skills is also essential to attain quality output. Training is a vehicle for Human resource development, is concerned with skills of employees and enhancing their capacity to cope with the ever changing demands of the works situation

Front office staff:

They are the first person to interact with patients, so proper training session should be organised to enhance their:

- Communication Skills
- Patient handling
- Time Management
- Decision Making
- Problem solving
- Inter relationship management

Reward System:

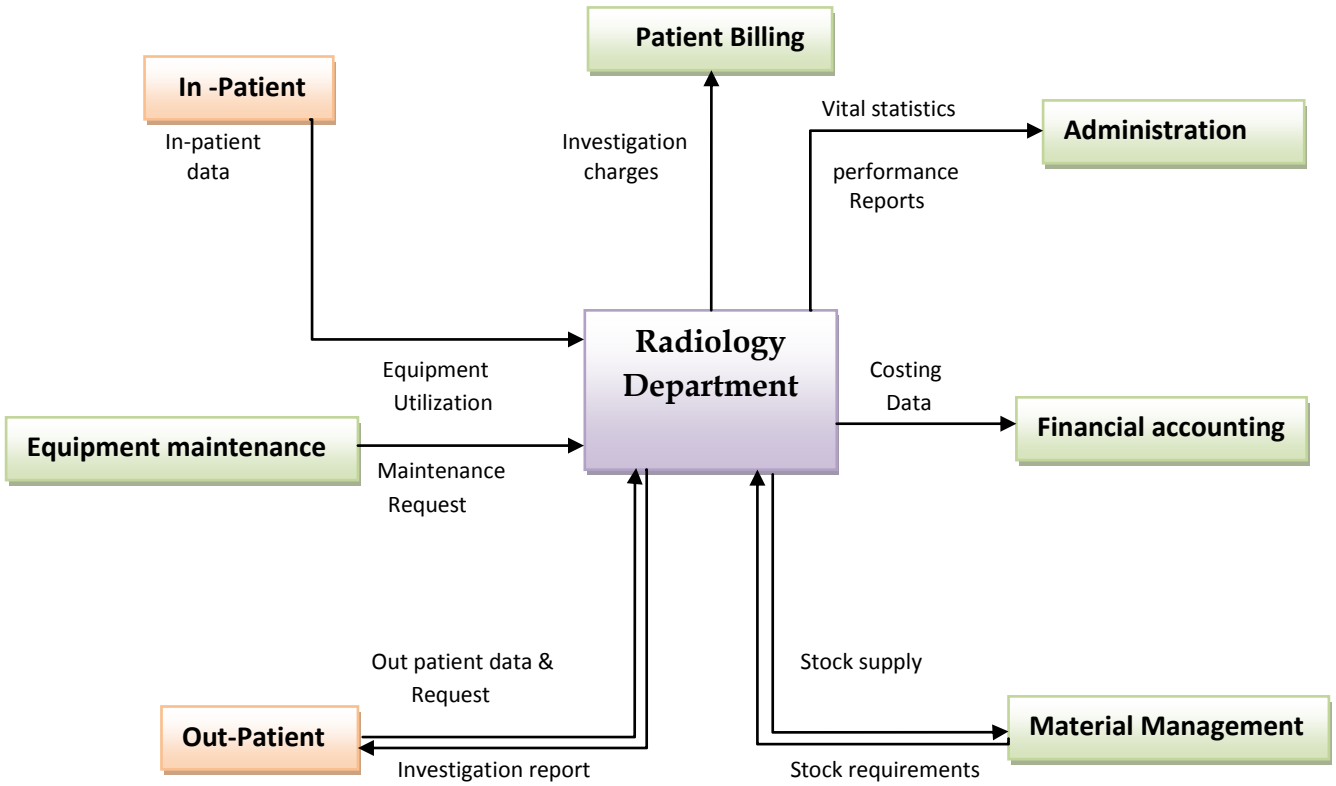
It is very essential to motivate the staff and satisfy personal needs as a result they will be linking their efforts to achieve goals. There can be variety of ways the employees can be motivated:

- Time Rates: it can be on the basis of number if extra efforts the employee devote for the work
- Performance Related Pay: Sometimes performance appraisal by one person may not be satisfactory. So Up, Down and around (360 Degree) reviews can be used for performance appraisal. This increases participant's acceptance of the direction provided by these evaluations and also would improve interrelationships.
- Flexible Benefits: it mainly comprises health insurance for employee and dependents, modification of working hours, work from home etc.

IMPACT OF COMPUTER OR HOSPITAL INFORMATION SYSTEM IN RADIOLOGY DEPARTMENT

Computers are assuming an increasing importance role in increasing the efficiency of the health care systems. The detailed study of radiology department clearly shows that in present scenario radiology information system is very essential. Due to increase in turnover of patients, increasing consumer awareness it has become almost essential for the radiology department.

Data Flow in Radiology Department



The main goals of HIS are:

- On line entry of investigation requests and their results
- Retrieval of information on patient and investigation results
- Patient billing and revenue collected
- Subunit wise investigation performed
- Online issue , consumption and updating of stock
- Periodic equipment statistics(down-time, up-time) etc
- Daily/ monthly performance reports
- Reductions in clerical work
- On time service with no delay in the process flow
- Improved inventory analysis
- Continuous monitoring
- Quality control and improvement
- Prevention of pilferage
- Reduction of Administration Expenses.

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ANNEXURE1

Questionnaire

for

Customer Perspective

MEASURING CUSTOMER / PATIENT PERCEPTION

IN

NARAYANA MULTISPECIALITY HOSPITAL, JAIPUR

Dear Sir/ Madam

We , at Narayana Multispecialty Hospital are committed to provide world class healthcare to our patients. In order to improve the Quality of care, your contribution is valuable to us. We request you to spare few minutes to discuss your experiences in the radiology department. We respect your confidentiality and your identity will not be revealed in any sense. Your responses will be purely for the academic and research purpose. We expect this study will help to understand our patients and their requirements and it will play a role in Continuous Quality Improvement of our services. I look forward for your participation.

Please rate your hospital visit in each of the areas listed below.

Please mark only one answer for each statement.

Thanks for Cooperation.

Patient Name:
MRN:

S.NO	QUESTIONS	OPTIONS	CODE
1	Staff at Registration/Billing counter did not waste time while assisting and was quick.	Excellent---------5 Very Good-------4 Good----------3 Fair----------2 Poor----------1	
2	Staff at Registration/Billing counter was knowledgeable about the bill components and was able to explain with ease.	Excellent---------5 Very Good-------4 Good----------3 Fair----------2 Poor----------1	
3	Explained the process and time taken to do the test.	Excellent---------5 Very Good-------4 Good----------3 Fair----------2 Poor----------1	
4	Were the staff polite and courteous while giving instruction to the patient , empathized and reassured when necessary.	Excellent---------5 Very Good-------4 Good----------3 Fair----------2 Poor----------1	
5	Did the staff informed you about the report collection process and time.	Excellent---------5 Very Good-------4 Good----------3 Fair----------2 Poor----------1	
6	How satisfied were you with cleanliness and appearance of the department?	Excellent---------5 Very Good-------4 Good----------3 Fair----------2 Poor----------1	
7	How satisfied were you with the security of your belongings?	Excellent---------5 Very Good-------4 Good----------3 Fair----------2 Poor----------1	
8	Are the Signage and Directions easy to follow?	Excellent---------5 Very Good-------4 Good----------3 Fair----------2 Poor----------1	

9	Sitting arrangement provided in the waiting area satisfactory	Excellent---------5 Very Good-------4 Good----------3 Fair----------2 Poor----------1	
10	Overall experience at Radiology	Excellent---------5 Very Good-------4 Good----------3 Fair----------2 Poor----------1	

ANNEXURE 2

Questionnaire for Employee Perspective

MEASURING EMPLOYEES PERCEPTION

IN

NARAYANA MULTISPECIALITY HOSPITAL, JAIPUR

Dear Sir/ Madam,

We at Narayana multispecialty Hospital believe that Employees are the most important assets of the organisation and their satisfaction is very essential.

All information collected is going to be used for academic purposes only. Please fill the answers honestly. In no conditions this information will be revealed to any other person. Please answer all the questions.

Looking forward for your active participation.

Thanks for your cooperation.

Employee Name:

Employee ID:

S.NO	QUESTINS	OPTIONS	CODE
1	**I am given enough authority to make decisions I need to make.**	**Agree Strongly**--------5 **Fairly Agree** -------4 **Agree**--------3 **Disagree** ----------2 **Strongly Disagree**----1	
2	**I feel part of a team working toward shared goals**	**Agree Strongly**--------5 **Fairly Agree** -------4 **Agree**--------3 **Disagree** ----------2 **Strongly Disagree**----1	
3	**I like the type of work that I do**	**Agree Strongly**--------5 **Fairly Agree** -------4 **Agree**--------3 **Disagree** ----------2 **Strongly Disagree**----1	
4	**I like the people I work with at Hospital**	**Agree Strongly**--------5 **Fairly Agree** -------4 **Agree**--------3 **Disagree** ----------2 **Strongly Disagree**----1	

5	**Communications from management keep me up to date on the hospital**	**Agree Strongly**--------5 **Fairly Agree ---**----4 **Agree**--------3 **Disagree** ----------2 **Strongly Disagree**----1	
6	**Training provided by the Hospital are as much as I needed**	**Agree Strongly**--------5 **Fairly Agree ---**----4 **Agree**--------3 **Disagree** ----------2 **Strongly Disagree**----1	
7	**I believe my salary is fair for my responsibilities**	**Agree Strongly**--------5 **Fairly Agree ---**----4 **Agree**--------3 **Disagree** ----------2 **Strongly Disagree**----1	
8	**I am satisfied with the Overall benefits package (welfare programs like group insurance, accident insurance & others)**	**Agree Strongly**--------5 **Fairly Agree ---**----4 **Agree**--------3 **Disagree** ----------2 **Strongly Disagree**----1	
9	**My superior gives me a constructive feedback about my performance and keep me motivated**	**Agree Strongly**--------5 **Fairly Agree ---**----4 **Agree**--------3 **Disagree** ----------2 **Strongly Disagree**----1	
10	**I am satisfied with the Leave policy of the hospital**	**Agree Strongly**--------5 **Fairly Agree ---**----4 **Agree**--------3 **Disagree** ----------2 **Strongly Disagree**----1	