

Impact Assessment of  
**Supply of  
CT-Scanner to  
Civil District Hospital**  
(Vemulawada)

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**Project Duration FY 2021-2022**

## Executive Summary

Supply of CT Scanner to Civil District Hospital Vemulawada Project, part of HDFC Bank's Parivartan program, elevates Civil District hospitals by providing advanced medical equipment. The project focuses on enhancing diagnostic accuracy and treatment efficacy, contributing to overall patient well-being. With a primary goal of fortifying medical infrastructure, HDFC Bank aims to empower healthcare institutions to effectively combat the challenges posed by Civil District through cutting-edge technologies.

The Supply of CT-Scanner to Civil District Hospital Project has significantly enhanced healthcare delivery at Civil District Hospital through strategic equipment installation.

Supplied 1 CT Scanner along with additional apparatus.

Catering to 2 Hospital Departments.

The Medical Infra Support has catered 430\* Patients up until now.

Reduced Turnaround Time (TAT) for CT reports from 8 to 2 hours.

The Medical Equipment Supply to Civil District Hospital Project excels in OECD-DAC Framework criteria, ensuring international standards:

### Relevance

- Addresses crucial healthcare gaps at Civil District Hospital, Vemulawada.
- Transforms the hospital into a regional hub for advanced diagnostics.
- Directly contributes to elevated health outcomes for patients.

### Effectiveness

- Significant reduction in Turnaround Time (TAT) for CT-Scans.
- Directly serves 430 patients, marking a quantitative and qualitative shift.
- Swift processing of routine CT-Scan reports reduces TAT from 8 to 2 hours.

### Impact

- Transforms hospital's diagnostic capabilities, reflected in reduced TAT.
- Serves 430 individuals, demonstrating a tangible impact on patient outcomes.

### Coherence

- Seamlessly aligns with the hospital's overarching objectives.
- Choice of cutting-edge CT-Scanning technology tailored to unique diagnostic needs.

### Efficiency

- Meticulous implementation and seamless integration of advanced CT-Scanning tools.
- Collaborative efforts during installation, comprehensive training sessions, and proactive maintenance.

### Sustainability

- Commitment to routine checks, adherence to guidelines, and proactive approaches.
- Ensures long-term functionality of the CT-Scanner, emphasizing sustainability.

The Civil District Hospital's equipment evaluation offers crucial insights into operational efficiency, safety measures, and evolving healthcare needs. Key findings include:

### CT Scan Machine

- Commendable operational efficiency and reliability.
- Smooth rotation of the gantry and accurate movement of the patient table.
- Adherence to radiation safety standards, with an opportunity for improvement in documentation practices.

### CT Workstation

- Verified authentication mechanisms and user training in place.
- Proper functionality of connected peripherals and technical support availability.
- Opportunity for improvement in antivirus software updates.

### UPS Power Backup Batteries

- New batteries within satisfactory operational range.
- Proactive planning not required for battery replacement.
- Adherence to recommended load capacity and storage practices.

### Power Injector

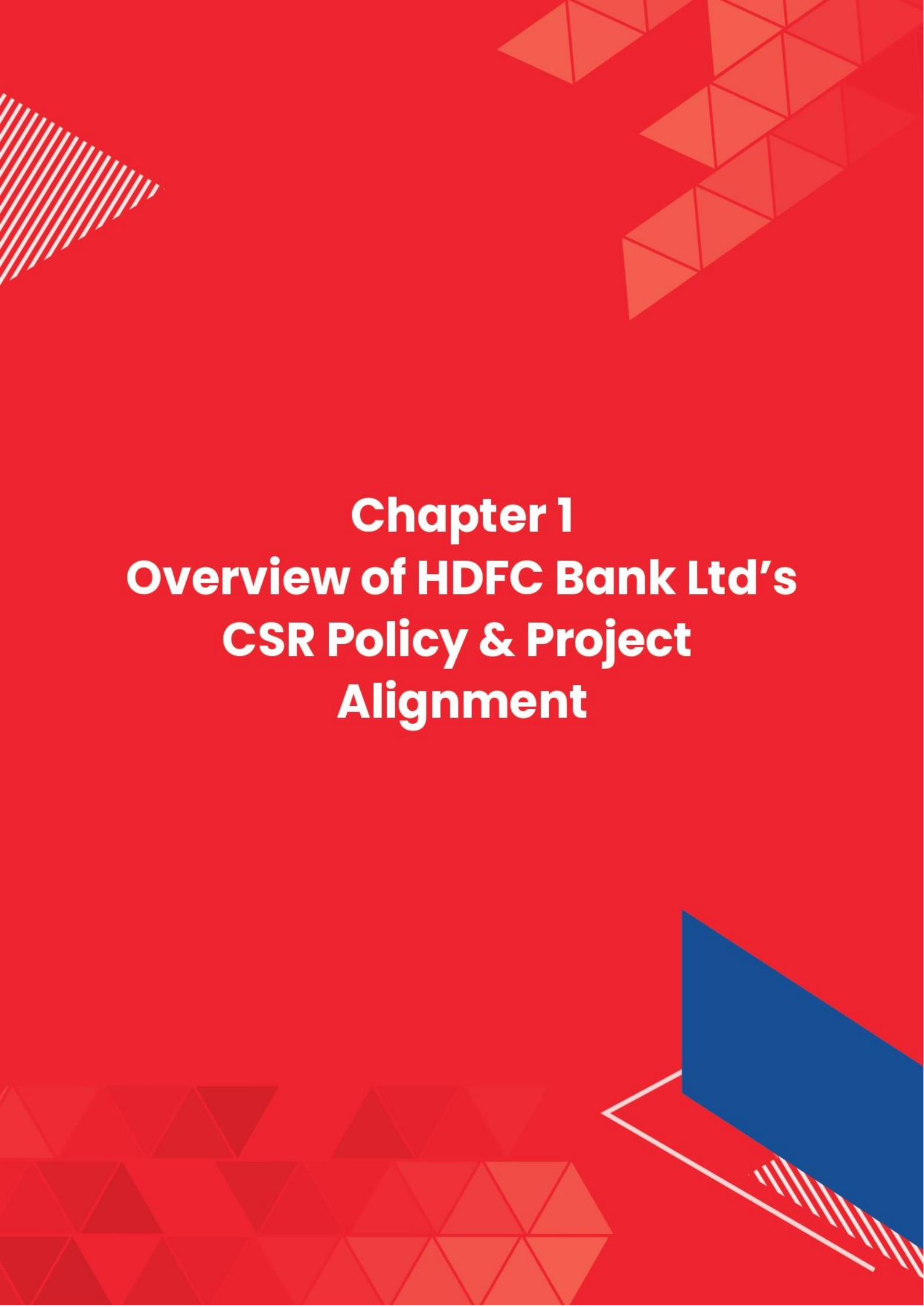
- Effective warm-up function and accurate flow rate calibration.
- Identified opportunity for refresher training on new features or updates.
- Overall positive conditions in operational effectiveness and safety features.

### Lead Aprons (n=2)

- Clean, flexible, and in good condition, adhering to safety standards.
- Adherence to cleaning protocols and coverage of areas requiring protection.
- Monitoring of radiation exposure with Radiation Thermoluminescent Dosimeter (TLD) monitors.

## Contents

Executive Summary.....	2
.....	6
1.1 HDFC Bank’s CSR Policy.....	7
1.2 Project Context .....	8
1.3 Alignment with SDGs .....	8
1.4 Alignment with National Policies .....	9
1.5 Alignment with CSR Policy .....	9
1.6 Alignment with ESG Principle.....	10
2.1 Objective of The Study .....	12
2.2 Approach and Evaluation Framework.....	12
.....	12
2.3 Stakeholder Interaction .....	14
3.1 Theory of Change .....	16
3.2 Observations Made Under OECD-DAC Framework .....	17
3.3 Observational Analysis of Medical Equipment Condition Assessment.....	19



# **Chapter 1**

## **Overview of HDFC Bank Ltd's CSR Policy & Project Alignment**

## 1.1 HDFC Bank's CSR Policy

HDFC Bank is actively contributing to the improvement of the lives of millions of Indians through their social initiatives. These endeavours, collectively known as 'Parivartan,' are designed with the objective of fostering sustainable empowerment within communities, thereby making significant contributions to the economic and social development of the nation.

HDFC Bank has a long-standing commitment to corporate social responsibility (CSR), and healthcare is one of its key focus areas. The bank has implemented a number of CSR projects in the healthcare sector, with the goal of improving access to quality healthcare for underserved communities.

The themes of HDFC's CSR project include:

1. **Rural Development:** HDFC Bank team believes in including villages in economic progress for overall development. The Bank's Holistic Rural Development Programme (HRDP) addresses the specific needs of each village through carefully planned interventions, developed in consultation with the community and stakeholders.
2. **Skill development and livelihood enhancement:** In the realm of Skill training and livelihood enhancement, Parivartan provides backing of numerous projects. This initiative encompasses capacity building, the promotion of financial literacy, credit and entrepreneurial endeavours, along with enhancing skills for agricultural and related practices.
3. **Promotion of Education:** The bank's educational initiatives are designed to foster learning by establishing a conducive and efficient learning atmosphere in schools. Within the second pillar of education in Parivartan, the interventions concentrate on teacher training, incorporating alternative methods, promoting innovation, and enhancing school infrastructure through refurbishment. HDFC Bank Parivartan has introduced smart classes in various states, aiming to integrate technology with education.
4. **Healthcare and Hygiene:** In the area of Healthcare and Hygiene, primary efforts revolve around supporting the Indian Government's Swachh Bharat Abhiyan through initiatives that raise awareness, induce behavioural change, and construct toilets. Additionally, to foster healthcare and hygiene, the Bank regularly conducts health camps, raises awareness about nutrition, ensures access to clean drinking water, and organizes blood donation drives. Moreover, the Bank has installed oxygen plants at 18 locations nationwide to aid hospitals in meeting the heightened demand for oxygen during the COVID-19 pandemic.
5. **Financial Literacy and Inclusion:** They hold the belief that the initial stride toward financial inclusion involves fostering financial literacy. Through HDFC Bank's extensive network of over 5,400 branches, millions have gained insights into fundamental concepts like savings, investment, and accessing organized financial resources via financial literacy camps conducted nationwide. Moreover, their branches emphasize delivering basic financial services and implementing capacity-building programs.





## 1.2 Project Context

In response to the escalating global healthcare challenges, HDFC Bank has extended its commitment to comprehensive healthcare interventions. In India, where the prevalence of Civil District has become a pressing concern, HDFC Bank, as part of its Parivartan program, initiated the Supply of CT Scanner Machine Project in Vemulawada. This targeted initiative reflects the bank's dedication to addressing critical healthcare gaps, specifically in the realm of Civil District diagnosis and treatment.

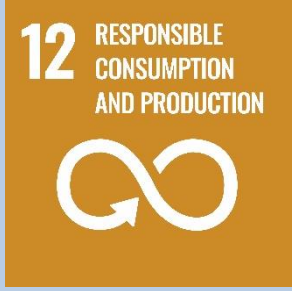

Aligned with the bank's ethos of social responsibility, this project serves as a focused intervention to enhance the capabilities of Civil District hospitals in Vemulawada. Collaborating with selected Civil District care institutions, HDFC Bank aims to significantly contribute to improving diagnostic precision, treatment efficacy, and overall patient outcomes. Operating within the broader framework of the Parivartan program, this initiative underscores the bank's commitment to instigating positive change and social impact.

The primary objective of the G0010 project is to strengthen the medical infrastructure of Civil District hospitals in Vemulawada through the provision of a CT Scanner Machine. HDFC Bank seeks to empower healthcare institutions to more effectively address the challenges posed by Civil District. The strategic deployment of advanced diagnostic technologies is anticipated to bring about a tangible and enduring improvement in the quality of care provided to individuals grappling with various forms of Civil District.

## 1.3 Alignment with SDGs

SDG Goals	SDG Targets	Alignment
 <p><b>3 GOOD HEALTH AND WELL-BEING</b></p>	<p><b>Goal 3: Good Health and Well-being</b></p> <p><b>3.3</b> By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases.</p>	Completely
 <p><b>9 INDUSTRY, INNOVATION AND INFRASTRUCTURE</b></p>	<p><b>Goal 9: Industry, Innovation and Infrastructure</b></p> <p><b>9.1</b> Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support</p>	Completely



	economic development and human well-being, with a focus on affordable and equitable access for all.	
	<b>Goal 12: Responsible consumption and production</b>  12.2 By 2030, achieve the sustainable management and efficient use of natural resources	Completely
	<b>Goal 17: Partnership for the goals</b>  17.17 Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships	Completely

#### 1.4 Alignment with National Policies

National Policy/Scheme/Mission	Objectives & Strategies	Alignment
<b>National Health Policy 2017</b>	Ensure availability and access to affordable and quality healthcare services.	HDFC Bank Ltd.'s Supply of Medical Equipment to Civil District Hospital Project enhances diagnostic and treatment capabilities in Civil District hospitals, contributing to improved healthcare infrastructure.

#### 1.5 Alignment with CSR Policy

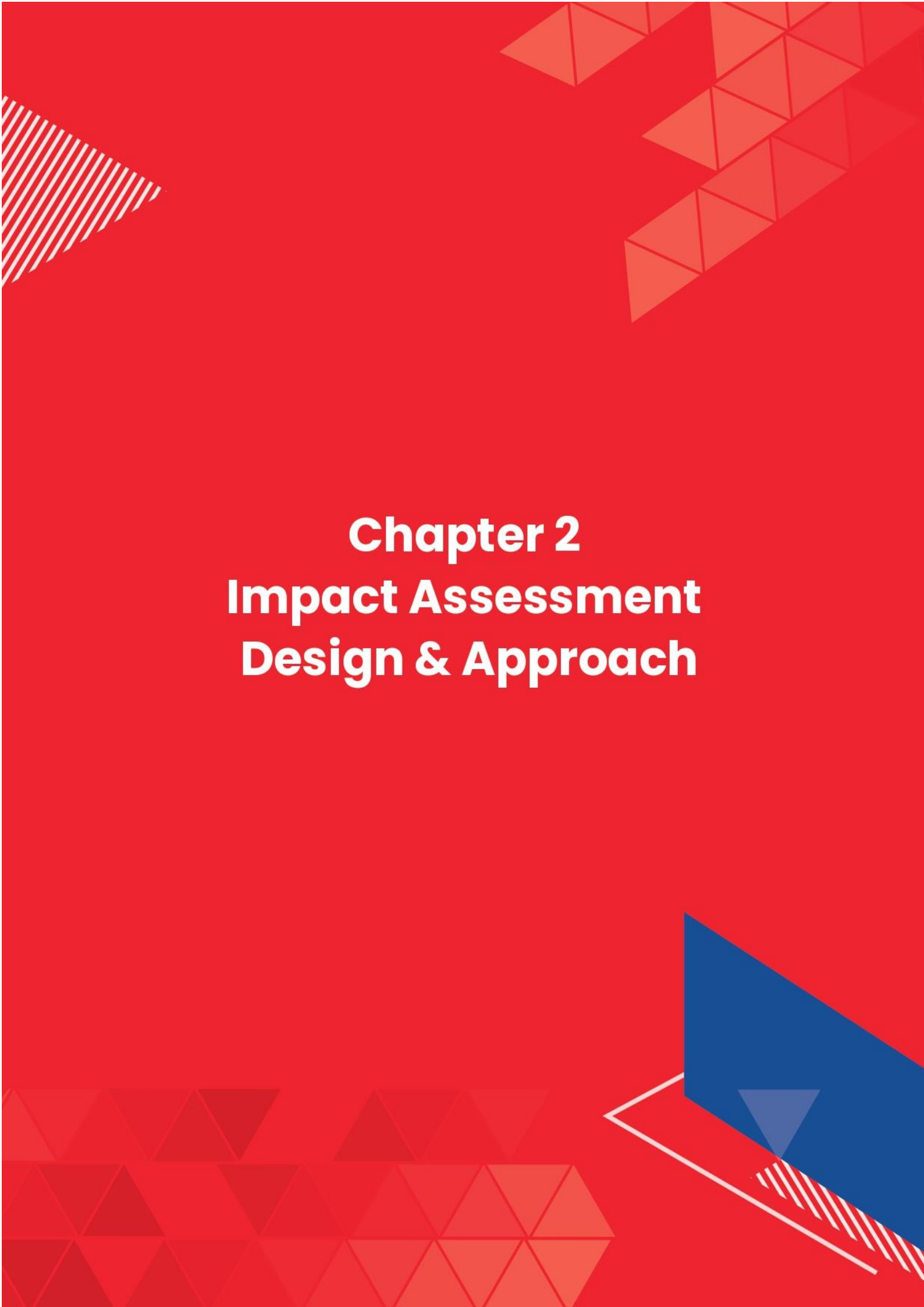
The Schedule VII (Section 135) of the companies act, 2013 specifies the list of the activities that can be included by the company in its CSR policy. The below mentioned table shows the alignments of the intervention with the approved activities by the Ministry of Corporate Affairs.

Sub-Section	Activities as per Schedule VII	Alignment
(i)	eradicating hunger, poverty and malnutrition, (Promoting health care including preventive Health) and sanitation (Including contribution to the Swatch Bharat Kosh set-up by the Central Government for the promotion of sanitation) and making available safe drinking water;	Partially
(viii)	contribution to the Prime Minister's National Relief Fund or [Prime Minister's Citizen Assistance and Relief in Emergency Situations Fund (PM CARES Fund) or] any other fund set up by the Central Government for socio-economic development and relief and welfare of the Scheduled Castes, the Scheduled Tribes, other backward classes, minorities and women;	Partially

## 1.6 Alignment with ESG Principle

The program's intervention also aligns with the ESG Sustainability Report of the corporate. Particularly, concerning the Business Responsibility & Sustainability Reporting Format (BRSR) shared by the Securities & Exchange Board of India (SEBI), the program aligns with the principle mentioned below:

<p><b>Principle 7</b></p> <p>Businesses should support a precautionary approach to environmental challenges</p>
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The background is a vibrant red color. It features several geometric patterns: a white and red striped triangle in the top-left corner; a cluster of light red triangles in the top-right corner; a large blue triangle in the bottom-right corner with a white outline and a striped triangle inside it; and a pattern of light red triangles at the bottom. The text is centered in the middle of the page.

# **Chapter 2**

## **Impact Assessment Design & Approach**

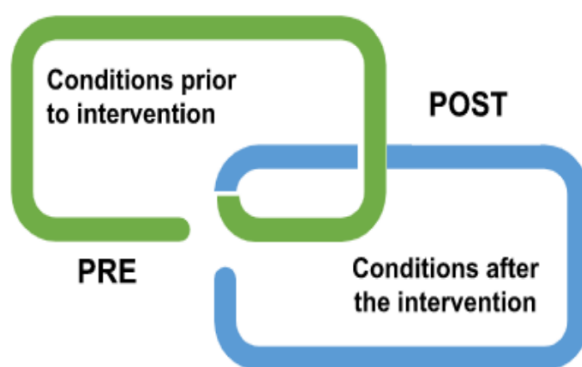
## 2.1 Objective of The Study

HDFC Bank Ltd. has partnered with CSRBOX to conduct a comprehensive Impact Assessment of the Supply of CT-Scanner to Civil District Hospital in Vemulawada Project FY 2021-22. The study aims to achieve the following objectives:

- To assess the impact of the supplied CT-Scanner on diagnostic capabilities in healthcare institutions.
- To evaluate the project's alignment with the National Civil District Control Programme's objective of technology upgradation through the provision of a CT-Scanner.
- To examine the extent to which the project complements the National Civil District Control Programme's objectives by strengthening diagnostic capabilities.
- To explore indirect support provided by the project in reducing out-of-pocket healthcare expenditure through improved diagnostic services.
- To assess the collaboration between HDFC Bank and healthcare institutions under the CT-Scanner Project, examining implications for improved healthcare delivery.
- To gather insights on areas for improvement in project implementation efficiency, resource utilization, and overall effectiveness in meeting evolving health needs related to diagnostic capabilities.
- To evaluate the sustainability of the project's impact, examining its alignment with long-term healthcare goals and contributions to building a resilient healthcare system for addressing future challenges.

The Impact Assessment for the CT-Scanner Project aims to provide valuable insights into the multifaceted impact of the initiative. Through a comprehensive examination, the assessment seeks to offer key findings for refining and optimizing the project's effectiveness in enhancing diagnostic capabilities and supporting technology upgradation in healthcare institutions.

## 2.2 Approach and Evaluation Framework

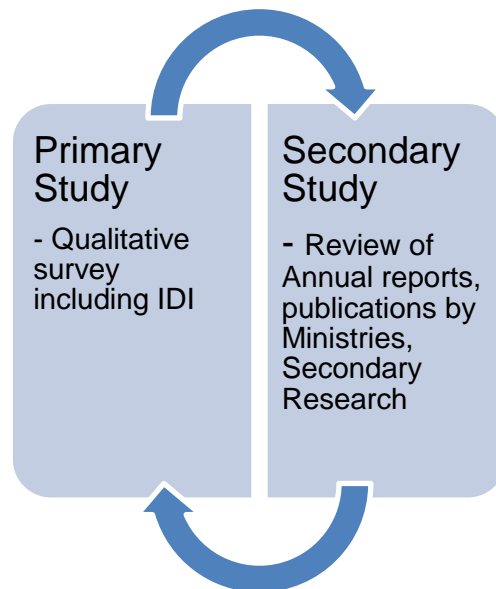


In line with the study's objectives and key areas of investigation, the evaluation's design prioritized learning as its primary goal. This section outlines our strategy for developing and implementing a robust, dynamic, and outcome-focused evaluation framework/design. To gauge the impact, the study proposes a pre-post program evaluation approach, relying on the recall capacity of the respondents. Under this method, beneficiaries are surveyed about their conditions before

and after program intervention. Analysing the difference helps to discern the program's contribution to enhancing the intended condition of the beneficiary. While this approach can effectively comment on the program's role in improving living standards, it may not entirely attribute all changes to the program.

For the assessment of the program, we employed a two-pronged approach to data collection and review that included secondary data sources and literature, as well as primary data

obtained through qualitative methods of data collection. The figure below illustrates the study approach used in data collection and review. The secondary study involved a review of functioning of Oxygen plants, and other studies and research by renowned organisations available in the public domain for drawing insights into the situation of the area.



The primary study comprised qualitative approach to data collection and analysis. The qualitative aspects involved in-depth interviews (IDIs) with the Medical Superintendent and Lab Technician.

In addition to primary data collection, the consultants studied various project documents like Project Proposal, Project log-frame (Logical Framework Analysis), and other relevant reports/literature related to the projects.

### **OECD-DAC Framework**

To determine the Relevance, Coherence, Effectiveness, Efficiency, Impact and Sustainability of the project, the evaluation used OECD-DAC framework. Using the logic model and the criteria of the OECD-DAC framework, the evaluation assessed the HDFC team's contribution to the results, while keeping in mind the multiplicity of factors that might have affected the overall outcome. The social impact assessment hinged on the following pillars:



### 2.3 Stakeholder Interaction

Detailed conversations were conducted with the Civil District Hospital staff, specifically engaging with the personnel responsible for overseeing the operations of the medical equipment supplied under the Parivartan Project. These discussions aimed to gather comprehensive insights into the day-to-day functioning of the equipment and its overarching impact on the operations and services provided by the Civil District Hospital. The goal was to gain a nuanced understanding of how the implemented initiatives, including the Supply of CT-Scanner Equipment to the Hospital, have influenced and improved the hospital's ability to deliver quality Civil District care to its patients.

Following stakeholders were considered for interaction to collect data:

Secondary Stakeholder	Mode of Data Collection	No. of Interactions
Medical Superintendent	In-Depth Interview	1
General Physician	In-Depth Interview	1
Lab Technician	In-Depth Interview	1
<b>Total Interactions</b>		<b>3</b>



# **Chapter 3**

## **Impact Findings**



### 3.1 Theory of Change

Activities	Output	Outcome	Impact
<ul style="list-style-type: none"> <li>• Installation of CT-Scanner machine in the hospital.</li> <li>• Other apparatus supplied.</li> <li>• Training sessions conducted for hospital staff.</li> </ul>	<ul style="list-style-type: none"> <li>• Number of CT-Scanner machines installed: 1.</li> <li>• Number of hospital departments equipped: 2.</li> <li>• Number of patients benefitted: 430.</li> </ul>	<ul style="list-style-type: none"> <li>• Increased access to advanced diagnostic facilities.</li> <li>• Enhanced efficiency in hospital operations.</li> <li>• Improvement in the accuracy and speed of diagnoses.</li> <li>• Increased knowledge and skills of healthcare staff.</li> <li>• Reduction in wait times for diagnostic procedures.</li> <li>• Improved quality of services provided by the hospital.</li> </ul>	<ul style="list-style-type: none"> <li>• Positive impact on the community's health.</li> <li>• Better healthcare service utilization.</li> <li>• Strengthened hospital capacity and capabilities.</li> <li>• Enhanced patient care and treatment outcomes.</li> <li>• Improvement in the overall healthcare services.</li> </ul>

The implementation of the CT-Scanner project at the hospital has yielded significant positive outcomes and impactful changes in healthcare delivery. The installation of a state-of-the-art CT-Scanner, along with the provision of necessary apparatus and targeted training sessions for hospital staff, has resulted in tangible benefits. With one CT-Scanner now operational and two hospital departments equipped, the project has directly benefitted 430 patients. This initiative has led to increased access to advanced diagnostic facilities, enhanced efficiency in hospital operations, improved accuracy and speed of diagnoses, and a reduction in wait times for diagnostic procedures. The impact extends beyond the hospital's walls, positively influencing the community's health, ensuring better healthcare service utilization, strengthening hospital capacity and capabilities, and ultimately enhancing patient care and treatment outcomes. The CT-Scanner project has successfully contributed to an overall improvement in the quality of healthcare services provided by the hospital, marking a significant milestone in our commitment to advancing healthcare standards.

## 3.2 Observations Made Under OECD-DAC Framework

As a comprehensive exploration of the impact assessment study, this section delves into the intricate findings and insights gleaned from the lens of the OECD-DAC framework. Employing an exhaustive 360-degree approach, the study unfolds through qualitative data collection involving diverse stakeholders engaged in the transformative Supply of CT-Scanner to Civil District Hospital Project (C0107). This nuanced approach ensures a panoramic understanding of the project's impact and effectiveness.

### 3.2.1 Relevance

In the context of the OECD-DAC Framework, the significance of the Supply of CT-Scanner to Civil District Hospital Project (C0107) becomes glaringly apparent. Positioned strategically to address pivotal healthcare voids within the Civil District Hospital, Vemulawada, this initiative emerges as a beacon for patients seeking advanced diagnostic interventions. Amidst a landscape marked by a scarcity of nearby facilities with state-of-the-art CT-Scanning capabilities, the project assumes the role of a lifeline, directly contributing to elevated health outcomes for patients. This transformative impact positions the Civil District Hospital as a regional hub for cutting-edge medical diagnostics, where the CT-Scanner becomes a catalyst reshaping the narrative of diagnostic accessibility and rendering tangible benefits to the community.

### 3.2.2 Effectiveness

The effectiveness of the Supply of CT-Scanner to Civil District Hospital Project permeates through the entire spectrum of hospital operations and patient care. The deployment of advanced CT-Scanning technology significantly elevates healthcare standards within the Civil District Hospital. A notable highlight is the substantial reduction in Turnaround Time (TAT) for CT-Scans, with the hospital now directly serving 430 individuals. The efficiency gains are particularly noteworthy in the swift processing of routine CT-Scan reports, obviating the need for external facilities and reducing TAT from 8 to 2 hours. This not only quantitatively enhances service throughput but marks a qualitative shift, enabling more precise, timely, and tailored patient care.

The Lab Technician says "*The CT-Scanner project has really amped up our diagnostic capabilities. We now process routine CT-Scan reports swiftly, providing quicker insights for better patient care and a more streamlined workflow.*"

### 3.2.3 Impact

The impact of the Supply of CT-Scanner to Civil District Hospital Project reverberates across various dimensions of healthcare delivery and patient outcomes. Beyond the quantitative metric of serving 430 individuals, the project's transformative role is palpable in the hospital's enhanced diagnostic capabilities. This is reflected in the reduced TAT for routine CT-Scans, providing timely insights and facilitating swift decision-making in patient care.

*"The CT-Scanner has not just reduced the TAT; it has fundamentally improved our ability to diagnose and treat patients promptly. It's a game-changer in healthcare, offering a level of precision we didn't have before. However, the absence of a neurology department limits its full potential. Having a dedicated department would make the CT-Scanner even more functional and enhance our ability to cater to a broader range of medical conditions."*, adds the General Physician.

### 3.2.4 Coherence

The coherence of the Supply of CT-Scanner to Civil District Hospital Project is manifest in its seamless alignment with the overarching objectives of the Civil District Hospital and the broader healthcare landscape. The choice of cutting-edge CT-Scanning technology is strategically tailored to address the unique diagnostic needs of the hospital, ensuring a cohesive integration into its existing infrastructure.

The Lab Technician adds *"The CT-Scanner seamlessly fits into our processes, enhancing our ability to deliver precise and effective care to our patients. It's not an isolated intervention."*

### 3.2.5 Efficiency

Efficiency in the Supply of CT-Scanner to Civil District Hospital Project is underlined by meticulous implementation and the seamless integration of advanced CT-Scanning tools into the hospital's infrastructure. The collaborative efforts during installation, comprehensive training sessions, and proactive maintenance contribute to the project's efficiency. The reduced TAT for routine CT-Scans stands as a testament to the project's efficiency gains, optimizing diagnostic capabilities and minimizing downtime.

### 3.2.6. Sustainability

The sustainability of the Supply of CT-Scanner to Civil District Hospital Project is evident in observed practices related to maintenance, training, and equipment functionality. The commitment to routine checks, adherence to guidelines, and proactive approaches ensure the long-term functionality of the CT-Scanner.

General Physician says *"Sustainability is not just about having the equipment; it's about ensuring that it continues to serve its purpose effectively. The CT-Scanner project has demonstrated a commitment to lasting impact, ensuring that the benefits persist over time."*

In summary, the Supply of CT-Scanner to Civil District Hospital Project stands as a testament to the hospital's commitment to excellence, demonstrating alignment with the OECD-DAC Framework parameters. Its relevance, effectiveness, impact, coherence, efficiency, and sustainability collectively contribute to an elevated standard of healthcare delivery and improved patient outcomes. The CT-Scanner, as a transformative tool, not only addresses current healthcare challenges but positions the Civil District Hospital as a leader in providing advanced and accessible medical diagnostic services to the community.

### 3.3 Observational Analysis of Medical Equipment Condition Assessment

Sl. No	List of Actions	Condition	Remarks
<b>CT Scan Machine</b>			
1	Power on the CT scanner and ensure it boots up without errors.	Checked: Yes	Well-conditioned, no errors detected.
2	Verify that the system software loads correctly.	Checked: Yes	Operating correctly without issues.
3	Check the emergency stop button for functionality.	Checked: Yes	Functioning properly.
4	Verify that the gantry rotates smoothly without unusual noise or resistance.	Checked: Yes	Smooth rotation without noise.
5	Test the movement of the patient table, ensuring it moves smoothly and accurately.	Checked: Yes	Patient table moves smoothly.
6	Check the X-ray tube for any signs of damage or wear.	Checked: No	No signs of damage or wear observed.
7	Test the collimation system to ensure accurate beam focus.	Checked: Yes	Collimation system is working properly.
8	Ensure compliance with radiation safety standards.	Checked: Yes	Compliance with safety standards ensured.
9	Check for and install any available software updates or patches.	Checked: Yes	SCQUOIA software available, up to date.
10	Ensure all equipment logs and maintenance records are up to date.	Checked: No	No log book for CT Equipment maintenance.
11	Document any issues or repairs needed.	Checked: No	CT equipment is working properly.

12	Test safety features such as interlocks and radiation alarms.	Checked: Yes	Safety features working properly.
13	Ensure the CT room is clean and free from obstructions.	Checked: Yes	CT room well-maintained and clean.
14	Verify proper ventilation and temperature control.	Checked: Yes	Adequate ventilation and temperature control observed.
15	Follow the manufacturer's recommendations and use the SCQUOIA, American Meditek System.	Checked: Yes	Adherence to manufacturer's recommendations ensured.
<b>CT Workstation</b>			
1	Verify user authentication mechanisms for secure workstation access.	Verified: Yes	Workstation authentication mechanisms verified and well-maintained.
2	Ensure users are adequately trained on the workstation and software.	Checked: Yes	Two technicians available for training.
3	Check the functionality of connected hardware peripherals.	Checked: Yes	Peripherals are working properly.
4	Ensure access to technical support services in case of issues.	Checked: Yes	Technical support services available on call.
5	Maintain contact information for technical support personnel.	Checked: Yes	Contact information is maintained.
6	Verify regular backups of patient data and system configurations.	Checked: Yes	Data backups performed from 12.10.22 to the present, with 430 patient records available.
7	Test the restoration process for backup data.	Checked: Yes	Restoration process is in place.
8	Confirm that security features are active and up to date.	Checked: No	Antivirus software installed but not updated.
9	Implement encryption measures for patient data.	Checked: Yes	Encryption measures are in place.
10	Test the image reconstruction process for accuracy and timeliness.	Checked: Yes	Normal reconstruction time is 30 minutes, 1-2 hours if findings are present.
11	Check sufficient storage space for CT scan images and data.	Checked: Yes	Adequate storage space available.
12	Monitor and manage data archives as needed.	Checked: Yes	Data archives are maintained with a register.
<b>UPS Power Backup Batteries</b>			
1	Determine the age of the batteries.	Status: New	Batteries are one year old.
2	Plan for replacement if batteries are approaching the end of their lifespan.	Status: No Replacement	Currently, no replacement is required.
3	Ensure that the load is within the UPS capacity to avoid overloading.	Status: Ensured	No overload observed.
4	Check for any audible or visual alarms on the UPS.	Checked: Yes	No audible or visual alarms detected.
5	Check if the current capacity matches the manufacturer's specifications.	Checked: Yes	Current capacity is 60KV, 120A.

6	Check for any physical damage or bulging on the UPS unit and batteries.	Checked: Yes	UPS unit and batteries are in good condition.
7	Ensure no signs of corrosion on battery terminals.	Checked: Yes	No corrosion observed.
8	Establish a battery replacement plan based on the manufacturer's recommendations.	Status: No Plan	No replacement plan currently in place.
9	Verify that the UPS and batteries are stored in a clean and well-ventilated environment.	Checked: Yes	Batteries are stored in a separate room.
10	Protect them from extreme temperatures and humidity.	Checked: Yes	Protection measures are in place.
<b>Power Injector</b>			
1	Ensure healthcare professionals using the power injector are adequately trained.	Checked: Yes	Healthcare professionals are trained.
2	Provide refresher training as needed for new features or updates.	Status: No	Refresher training not provided.
3	If the power injector has a warm-up function, test its effectiveness.	Checked: Yes	Warm-up function is effective.
4	Ensure the contrast agent is warmed to the desired temperature before injection.	Checked: Yes	Contrast agent is warmed up.
5	Confirm that the flow rate calibration is accurate.	Checked: Yes	Flow rate calibration is accurate.
6	Test the emergency stop button to ensure it halts the injection process immediately.	Checked: Yes	Emergency stop button works properly.
7	Inspect external components for any physical damage or wear.	Checked: No	External components are in good condition.
8	Verify that the user interface is responsive and displays information accurately.	Checked: Yes	User interface displays accurate information.
<b>Lead Aprons (n=2)</b>			
1	Ensure the lead apron is clean and free from stains or contaminants.	Checked: Yes	Lead apron is cleaned and well-maintained.
2	Follow appropriate cleaning protocols.	Checked: Yes	Cleaning protocols are followed.
3	Assess the flexibility of the lead apron for comfortable patient use.	Checked: Yes	Lead apron is comfortable for patients.
4	Verify that the apron covers areas requiring protection adequately.	Checked: Yes	Apron fits nicely.
5	Inspect the lead apron for any visible damage, including cracks, holes, or tears.	Checked: No	Lead apron is in good condition.
6	Check the thickness of the lead apron to ensure it meets safety standards.	Checked: Yes	

The meticulous assessment of the medical equipment at Civil District Hospital serves as a pivotal lens through which we gain insights into the operational dynamics, safety measures, and evolving needs within the healthcare infrastructure. The diverse array of equipment plays a critical role in supporting various functions, ranging from diagnostic precision to research endeavours, and ensuring the overall efficiency of healthcare delivery.

### **3.3.1 CT Scan Machine:**

- The CT scan machine at Civil District Hospital underwent a thorough examination, revealing commendable operational efficiency and reliability. During the assessment, it was observed that the CT scanner successfully powered on without encountering any errors, showcasing its robust and well-maintained condition.
- Additionally, the system software loaded correctly, ensuring seamless functionality without any issues. The emergency stop button, a critical safety feature, was found to be responsive and functioning correctly, contributing to the overall safety protocols of the hospital.
- The gantry, a pivotal component of the CT scan machine, exhibited smooth rotation without any unusual noise or resistance, indicating optimal performance. The movement of the patient table, an essential element for patient comfort and accurate imaging, was also tested and found to be smooth and accurate.
- Notably, the X-ray tube, a core component of the CT scanner, showed no signs of damage or wear, attesting to the hospital's commitment to regular maintenance and equipment care. The collimation system, crucial for accurate beam focus, was meticulously tested and deemed to be in proper working order, ensuring precise imaging outcomes.
- Furthermore, the CT scan machine at Civil District Hospital was found to be in compliance with radiation safety standards, emphasizing the institution's dedication to maintaining a safe environment for both patients and healthcare professionals. However, it was noted that there is currently no log book for CT equipment maintenance, highlighting an area for potential improvement in documentation practices.
- In summary, the comprehensive assessment of the CT scan machine underscores its integral role in the hospital's diagnostic capabilities, with the observed positive conditions reflecting the hospital's commitment to operational excellence and patient safety.

### **3.3.2 CT Workstation:**

- The CT workstation, a critical component of the imaging process, was subjected to a meticulous evaluation, revealing several positive aspects of its functionality. Authentication mechanisms ensuring secure access to the workstation were found to be verified and well-maintained, contributing to data security protocols.
- The training aspect for users operating the workstation was confirmed to be in place, with two technicians available for training purposes. This ensures that healthcare professionals utilizing the workstation are adequately equipped with the necessary knowledge and skills, enhancing overall operational efficiency.
- Connected hardware peripherals, such as printers and external storage devices, underwent thorough checks and were deemed to be working properly, contributing to the seamless integration of the workstation into the hospital's imaging workflow.



Technical support services were reported to be available on call, providing a valuable resource in the event of any issues or emergencies.

- Maintenance of contact information for technical support personnel further emphasizes the hospital's proactive approach to addressing potential challenges promptly. The regular backups of patient data and system configurations, performed from October 12, 2022, to the present, with 430 patient records available, highlight the hospital's commitment to data integrity and accessibility.
- However, the assessment revealed that while antivirus software is installed on the CT workstation, it is not currently updated. This area presents an opportunity for improvement to ensure that the workstation remains protected against evolving cybersecurity threats.
- In essence, the evaluation of the CT workstation affirms its pivotal role in supporting diagnostic processes, with the observed positive conditions indicating a robust and well-managed system. The identified areas for improvement provide valuable insights for refining and optimizing the workstation's effectiveness.

### **3.3.3 UPS Power Backup Batteries:**

- The uninterruptible power supply (UPS) system and its associated batteries were scrutinized to assess their overall functionality and condition. The age of the batteries, a crucial determinant of their operational lifespan, was determined to be relatively new, with the batteries being one year old.
- Planning for battery replacement, a proactive measure to ensure continuous and reliable power backup, was reported as not required presently, indicating that the batteries are within a satisfactory operational range. This assessment aligns with best practices in ensuring the reliability of backup power systems.
- The load capacity of the UPS system was confirmed to be within the recommended capacity, preventing the risk of overloading and subsequent system failures. A comprehensive check for audible or visual alarms on the UPS revealed no issues, signifying the system's stability.
- The current capacity of the UPS system, matching the manufacturer's specifications at 60KV and 120A, ensures that it meets the hospital's power requirements effectively. Additionally, a thorough inspection of the UPS unit and batteries indicated good conditions, with no signs of physical damage or bulging observed.
- Furthermore, the absence of corrosion on battery terminals contributes to the overall reliability of the UPS system. While a battery replacement plan based on the manufacturer's recommendations is currently not in place, this may be considered for future planning to maintain optimal system performance.
- The storage environment for the UPS and batteries, including cleanliness and ventilation, was verified and found to be in adherence to best practices. Protective measures against extreme temperatures and humidity further contribute to the sustained functionality of the UPS system.
- In conclusion, the evaluation of the UPS power backup batteries underscores their critical role in ensuring continuous power availability for essential medical equipment. The observed positive conditions and proactive measures taken by the hospital contribute to a reliable power backup infrastructure.

### **3.3.4 Power Injector:**

- The power injector, an integral component in medical imaging procedures, underwent a comprehensive assessment to evaluate its operational effectiveness and safety

features. The training status of healthcare professionals using the power injector was verified, confirming that they are adequately trained in its operation.

- However, the absence of refresher training for new features or updates highlights an area for potential improvement in ensuring that healthcare professionals are consistently updated on the latest advancements in injector technology.
- The warm-up function of the power injector, a critical aspect of its performance, was tested and found to be effective, ensuring that the injector is ready for use when needed. Additionally, the contrast agent warming process was confirmed to be in line with desired temperature requirements, contributing to accurate and reliable imaging outcomes.
- Calibration of the flow rate, a key parameter in injector performance, was assessed and deemed to be accurate, further enhancing the precision of contrast agent administration. The emergency stop button, a crucial safety feature, was tested and found to halt the injection process immediately, underscoring the hospital's commitment to patient safety.
- External components of the power injector were inspected for physical damage or wear, revealing that they are in good condition. The user interface, responsible for displaying information accurately, was verified and found to be responsive, ensuring healthcare professionals have access to real-time information during procedures.
- While external components were observed to be in good condition, the absence of refresher training for new features or updates suggests an opportunity for ongoing education to enhance the proficiency of healthcare professionals in utilizing the power injector to its full potential.
- In summary, the assessment of the power injector highlights its critical role in medical imaging procedures, with positive conditions indicating effective performance and safety features. The identified area for improvement in refresher training presents an opportunity for continuous professional development and optimization of the power injector's capabilities.

### **3.3.5 Lead Aprons (n=2):**

- The lead aprons, essential for providing radiation protection to healthcare professionals during medical procedures, underwent a comprehensive evaluation to ensure their cleanliness, functionality, and overall condition.
- The lead aprons were observed to be clean and free from stains or contaminants, highlighting the hospital's commitment to maintaining a hygienic and safe working environment. Appropriate cleaning protocols were verified to be followed, contributing to the longevity and effectiveness of the aprons.
- Flexibility assessments were conducted to ensure that the lead aprons conform comfortably to the patient's body, with positive outcomes indicating that they provide the necessary protection without compromising patient comfort. Verification that the aprons adequately cover areas requiring protection further underscores their effectiveness in ensuring safety.
- While one lead apron required further inspection for visible damage, the overall condition of the aprons was deemed to be good. Inspections for cracks, holes, or tears were conducted, revealing that the lead aprons are in good condition and capable of providing the required radiation protection.
- Thickness checks were performed to ensure that the lead aprons meet safety standards, with positive results indicating compliance with the necessary

specifications. Additionally, all CT staff were confirmed to have Radiation Thermoluminescent Dosimeter (TLD) monitors, contributing to the monitoring and regulation of radiation exposure.

- In conclusion, the evaluation of lead aprons affirms their crucial role in ensuring the safety of healthcare professionals during medical procedures involving radiation. The observed positive conditions and adherence to safety protocols contribute to a safe and secure working environment within the hospital.

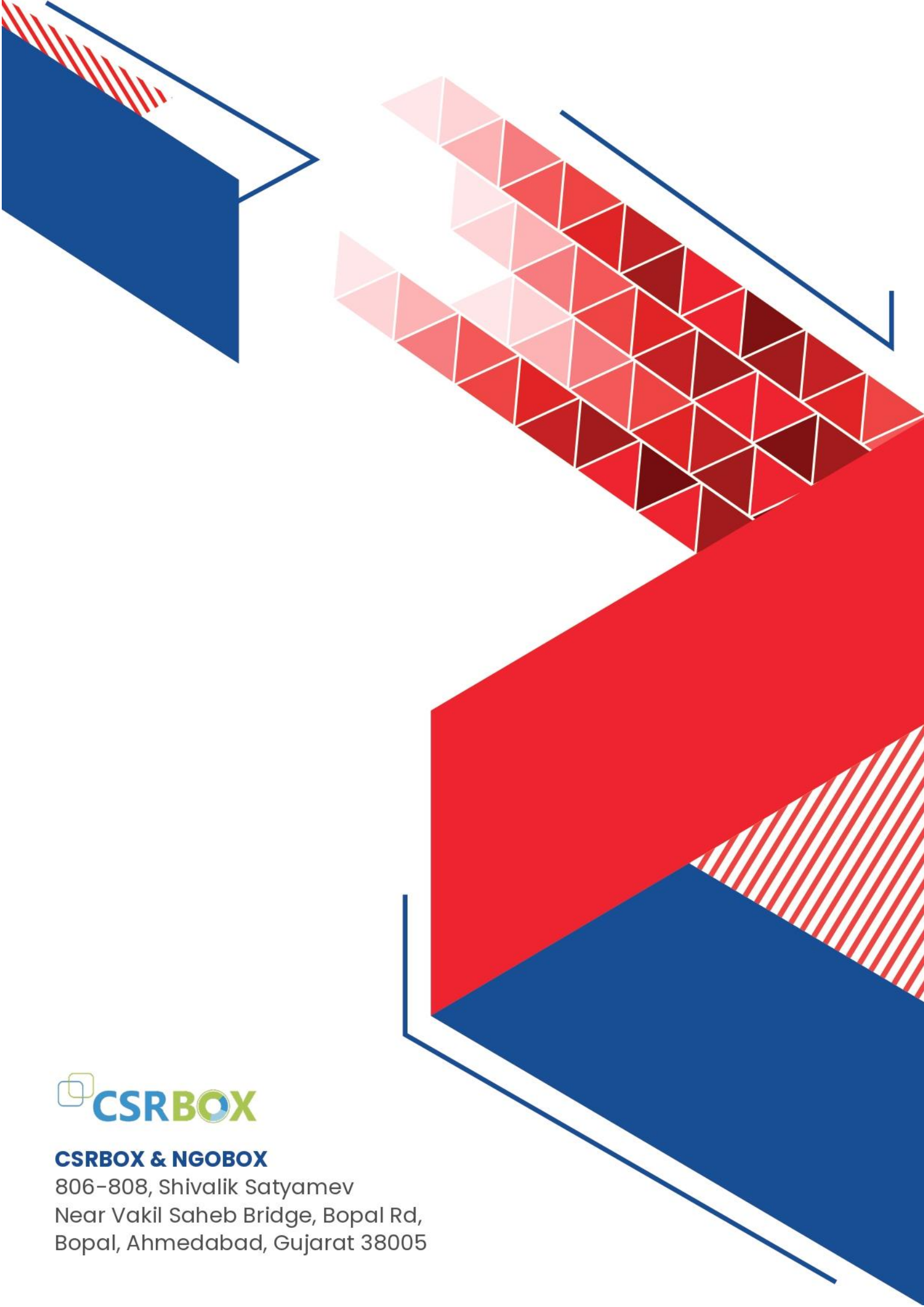
As the Hospital advances on its path toward continuous improvement, this evaluation serves as a strategic guide, directing the institution's focus to the influential relationship between medical equipment and healthcare outcomes. The positive conditions observed across these critical components not only validate the hospital's current operational acumen but also lay the foundation for future advancements. Through intentional investments in medical equipment, the institution not only meets the national standards, promising a future characterized by precision, efficiency, and seamless convergence of patient well-being.

The background is a solid red color. It features several decorative geometric patterns: a white and red striped triangle in the top-left corner; a cluster of light red triangles in the top-right corner; a dark blue triangle with a white outline and a small blue triangle inside, located in the bottom-right corner; and a pattern of light red triangles at the bottom. The text is centered in the middle of the page.

# **Chapter 4**

## **Recommendation**

Enhance Documentation Practices:	Implement a comprehensive log book system for all medical equipment maintenance, including the CT Scan Machine, to ensure a systematic record of inspections, repairs, and routine checks. This will contribute to improved accountability and adherence to maintenance schedules.
Regular Training and Refresher Programs:	Initiate regular training and refresher programs for hospital staff operating advanced medical equipment, including the CT Workstation and Power Injector. This will ensure that healthcare professionals stay abreast of the latest features and updates, optimizing the efficiency and safety of equipment use.
Update Antivirus Software:	Ensure timely and regular updates of antivirus software on the CT Workstation to enhance cybersecurity measures. This proactive step will safeguard the integrity of patient data and prevent potential risks associated with evolving cyber threats.
Establish a Battery Replacement Plan:	Consider developing a battery replacement plan for the UPS Power Backup Batteries based on the manufacturer's recommendations. This strategic approach will contribute to maintaining optimal system performance and avoiding unexpected disruptions in power supply during critical medical procedures.
Refine Equipment Maintenance Protocols:	Strengthen equipment maintenance protocols for the Power Injector by addressing the identified area for ongoing education. This includes providing continuous professional development opportunities to enhance the proficiency of healthcare professionals, ensuring the power injector is utilized to its full potential.
Regular Inspections for Lead Aprons:	Implement a regular inspection schedule for lead aprons, with a specific focus on detecting any visible damage. This proactive measure will contribute to sustaining a safe and secure working environment for healthcare professionals during procedures involving radiation.
Continuous Community Engagement:	Continue and expand community engagement initiatives to raise awareness about the advanced medical services offered by the hospital. This will contribute to increased community trust, utilization of healthcare services, and overall positive health outcomes.
Periodic Impact Assessments:	Conduct periodic impact assessments to track and measure the sustained effectiveness of the medical equipment and projects. This will provide valuable insights for ongoing improvements and ensure that the hospital remains at the forefront of healthcare provision.
Collaborative Learning Platforms:	Facilitate collaborative learning platforms or forums for healthcare professionals to share best practices and experiences related to the use of advanced medical equipment. This will foster a culture of continuous learning and knowledge exchange within the hospital.



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