

JK LAKSHMIPAT UNIVERSITY
Institute of Design

Rad X - Reimagine the world of radiology

VOL 1 of 2

Student **:- Manasi Saxena**

Sponsor**:- 5C Network India Pvt Ltd**

Mentor**:- Mr Anirudh Biswas**

Programme :-
Masters of Design (M.Des)
Interaction Design

THE GRADUATION PROJECT 2024

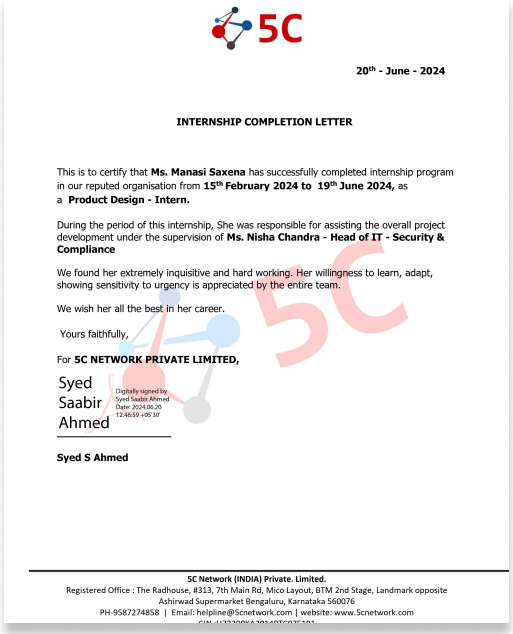
Acknowledgments

The four-month graduation project was an amazing learning experience. I would like to thank JK Lakshmipath University for guiding me throughout to achieve my goal of learning Design. I would like to thank 5C Network Pvt Ltd, Bangalore for giving me this immense opportunity to work on such a humanizing subject.

I would also take this opportunity to thank my mentor Mr. Anirudh Biswas and my manager Mrs. Nisha Chandra at 5C Network Pvt Ltd, for providing me with the right inputs and all necessary resources to complete this project. My acknowledgment would be incomplete without mentioning my colleagues, friends, and family for their constant motivation and feedback.

Project Brief

In my graduation project for Product Design at 5C Network Pvt. Ltd., I will focus on enhancing the company's cloud-based teleradiology solutions. This will involve conducting comprehensive user research to refine the interface and elevate the overall user experience of the application. I will collaborate closely with the development team to ensure seamless integration of the design and thorough testing of functionality. Through this initiative, I am committed to delivering a design centered around the user, seamlessly combining functionality with aesthetic appeal.



5C

20th - June - 2024

INTERNSHIP COMPLETION LETTER

This is to certify that **Ms. Manasi Saxena** has successfully completed internship program in our reputed organisation from **15th February 2024 to 19th June 2024,** as a **Product Design - Intern.**

During the period of this internship, She was responsible for assisting the overall project development under the supervision of **Ms. Nisha Chandra - Head of IT - Security & Compliance**

We found her extremely inquisitive and hard working. Her willingness to learn, adapt, showing sensitivity to urgency is appreciated by the entire team.

We wish her all the best in her career.

Yours faithfully,

For **5C NETWORK PRIVATE LIMITED,**

Syed Saabir Ahmed

Digitally signed by Syed Saabir Ahmed
Date: 2024.06.20 12:46:59 +05'30'

Syed S Ahmed

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PH-9587274858 | Email: helpline@5cnetwork.com | website: www.5cnetwork.com

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Introduction

About JK Lakshmipath University

About Institute of Design

About Mentor

About 5C Network Pvt Ltd

Team of 5C Network

Timeline

Design Process





About JK Lakshmipath University

JK Lakshmipath University (JKLU) in Jaipur is renowned for its Design Institute, a hub for creative minds. Offering a blend of theoretical and practical learning, the institute prepares students for the dynamic design industry. With state-of-the-art facilities, experienced faculty, and a focus on interdisciplinary learning, students thrive in a collaborative environment. The institute emphasizes critical thinking, problem-solving, and design thinking, equipping graduates with the skills to succeed and innovate in their careers. JKLU's Design Institute is committed to nurturing the next generation of design leaders.

About Institute of Design

The Design Institute at JKLU offers a comprehensive curriculum that blends theoretical knowledge with practical application, preparing students to meet the dynamic challenges of the design industry. With state-of-the-art facilities, experienced faculty, and a focus on interdisciplinary learning, the institute provides a nurturing environment for aspiring designers.

Students at the Design Institute benefit from a collaborative learning atmosphere, industry interactions, and opportunities for hands-on projects. The institute's emphasis on critical thinking, problem-solving, and design thinking equips graduates with the skills needed to succeed in their careers and make meaningful contributions to society.

JKLU's Design Institute is dedicated to shaping the next generation of design leaders, encouraging innovation, creativity, and a commitment to excellence in all its students.



About Mentor

Anirudha Biswas is an interdisciplinary industrial designer with a background in Civil Engineering from Biju Patnaik University, Orissa, and a Master's in Design from the National Institute of Design, Ahmedabad. He has received several international awards, including the Red Dot award for sustainable rural innovation-led development in 2017 and multiple Red Dot nominations for innovative design in subsequent years. His hanger designs were nominated for the A Design Award in Italy, 2018, and his bamboo lifestyle designs are part of the World Bamboo Museum's permanent collection in Damyang, Korea.
In India, Anirudha has served as the Design Manager for Godrej and Boyce Pvt. Ltd., overseeing research and strategy for new product development in B2C and CMF for B2B markets. He also worked at Pearl Academy, mentoring students and guiding industrial collaborative projects. His expertise includes NPD, Material Innovation, IPD, and CMF. Anirudha also contributed to brand development for Suta, Mumbai, in 2015.



About Company

5C Network Pvt Ltd, based in Bangalore, was founded by Syed Ahmed and Kalyan Sivasailam in 2016. The company emerged from their vision to revolutionize the radiology sector in India by leveraging technology to improve access, accuracy, and efficiency in radiology services.

The increasing dependence on radiology for diagnosis, therapeutics, monitoring, and prognosis has placed an immense burden on the radiology fraternity. While the number of diagnostic centers and hospitals providing radiology services is increasing, there is a shortage of radiology experts, especially sub-specialists such as cardiovascular radiologists, neuroradiologists, etc. We at 5C Network are bringing together the 5 stakeholders of radiodiagnosis—the Doctor, Radiologist, Patient, Technologist, and Hospital or Imaging Centre to provide a solution and facilitate effortless functioning. Harnessing the power of technology, we are on a mission to ensure that every radiology image in the country is attended to within 2-3 hours.

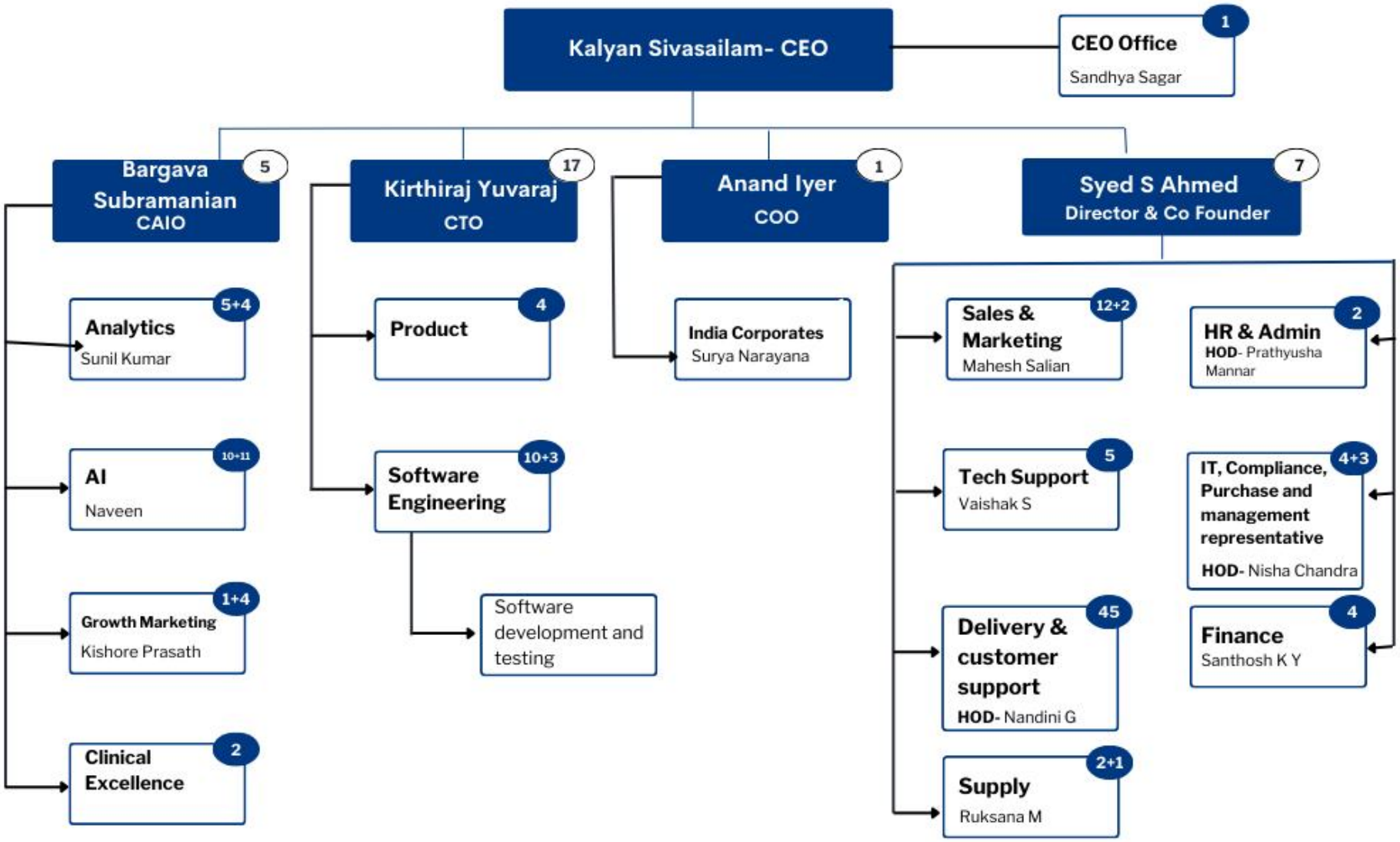




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Their innovative platform allows hospitals and diagnostic centers to upload scans to the cloud, where 5C Network's proprietary algorithms facilitate automated data extraction and analysis. This process significantly reduces the turnaround time for radiology reports from the typical 48 hours to just 42 minutes, ensuring faster and more accurate diagnoses.

Organizational Chart


Kalyan Sivasailam- CEO
CEO Office
1
Sandhya Sagar
Bargava Subramanian
CAIO
5
Kirthiraj Yuvaraj
CTO
17
Anand Iyer
COO
1
Syed S Ahmed
Director & Co Founder
7
Analytics
5+4
Sunil Kumar
AI
10+11
Naveen
Growth Marketing
1+4
Kishore Prasath
Clinical Excellence
2
Product
4
Software Engineering
10+3
Software development and testing
India Corporates
Surya Narayana
Sales & Marketing
12+2
Mahesh Salian
Tech Support
5
Vaishak S
Delivery & customer support
45
HOD- Nandini G
Supply
2+1
Ruksana M
HR & Admin
2
HOD- Prathyusha Mannar
IT, Compliance, Purchase and management representative
4+3
HOD- Nisha Chandra
Finance
4
Santhosh K Y



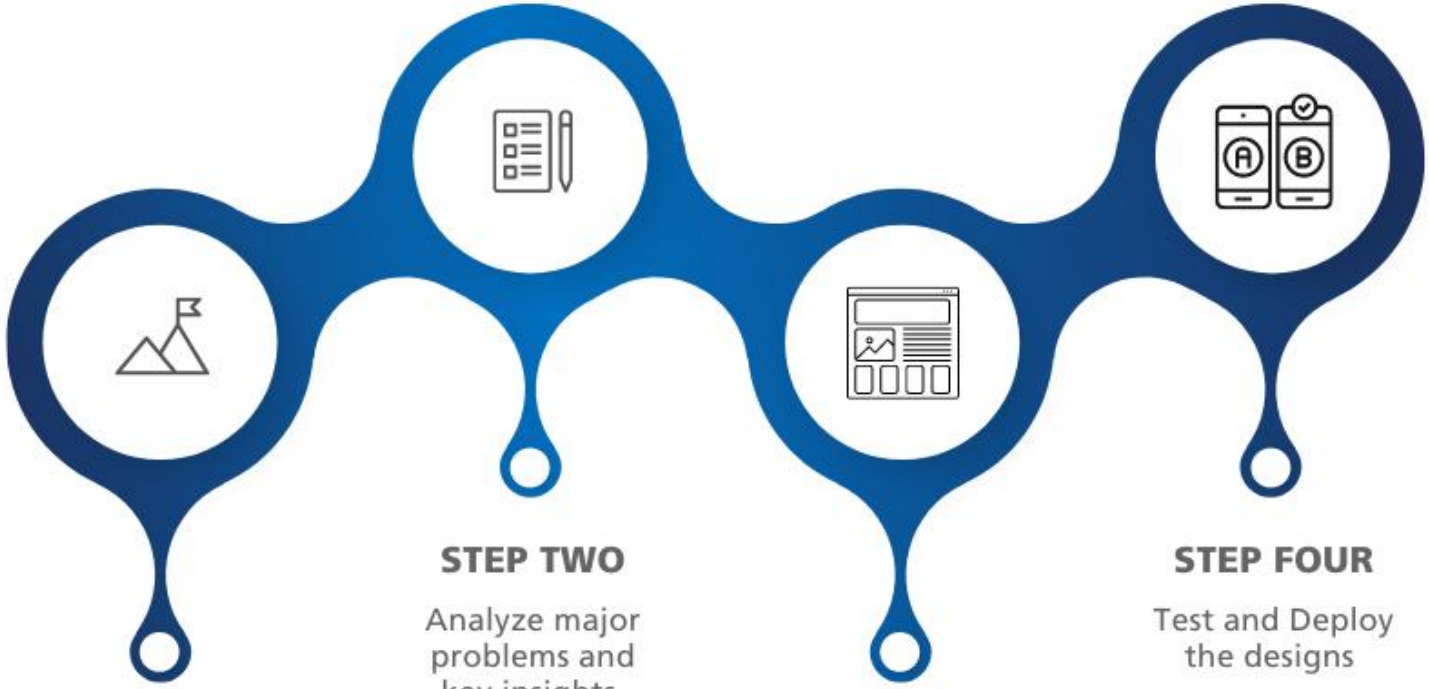
How it was started?

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Framework and Design Process

User Centered Design



STEP ONE

Understanding the Objective and goal setting

Understand

STEP TWO

Analyze major problems and key insights

Specify

STEP THREE

Ideate and design the solution

Design

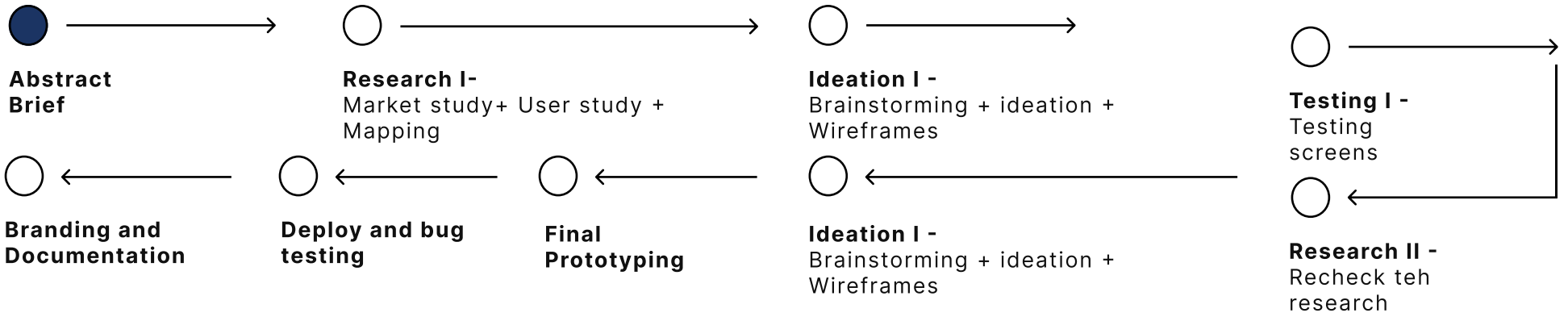
STEP FOUR

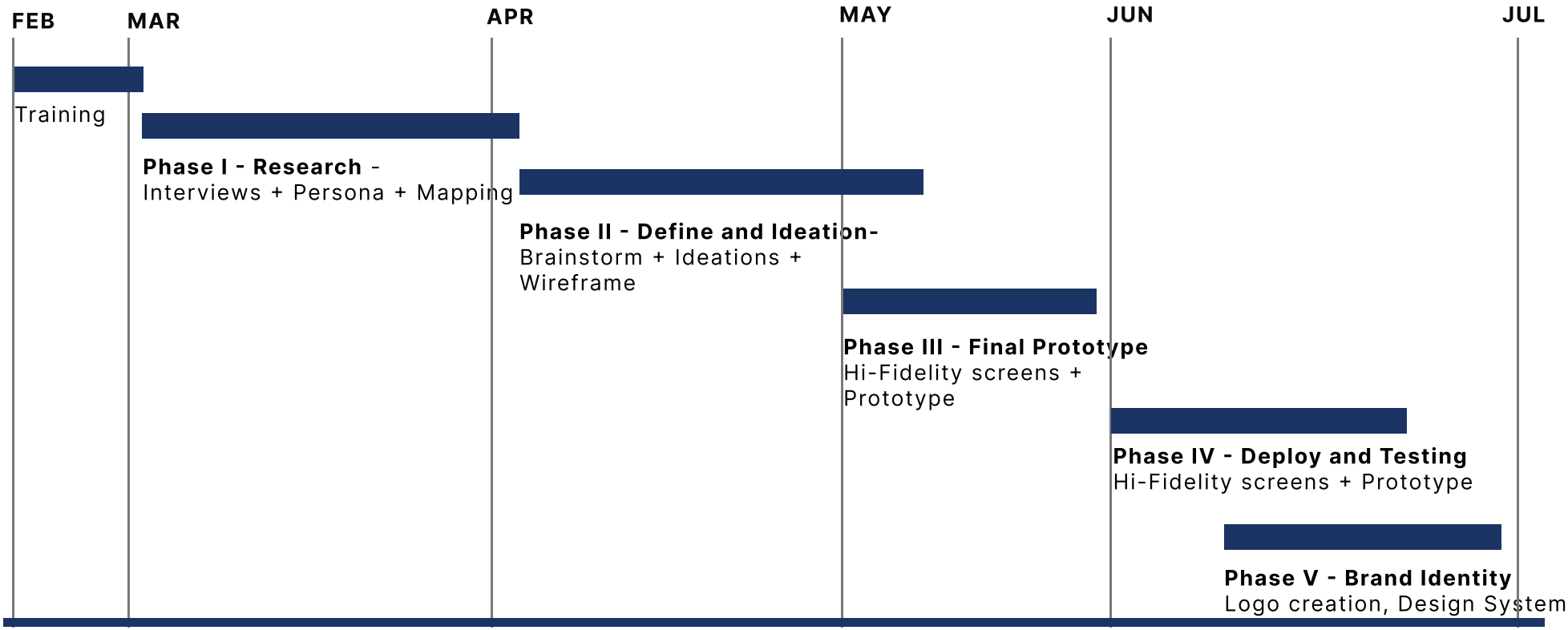
Test and Deploy the designs

Evaluate

Timeline

Timeline


Abstract Brief
Research I- Market study+ User study + Mapping
Ideation I - Brainstorming + ideation + Wireframes
Testing I - Testing screens
Research II - Recheck teh research
Ideation I - Brainstorming + ideation + Wireframes
Final Prototyping
Deploy and bug testing
Branding and Documentation


FEB
MAR
APR
MAY
JUN
JUL
Training
Phase I - Research - Interviews + Persona + Mapping
Phase II - Define and Ideation- Brainstorm + Ideations + Wireframe
Phase III - Final Prototype Hi-Fidelity screens + Prototype
Phase IV - Deploy and Testing Hi-Fidelity screens + Prototype
Phase V - Brand Identity Logo creation, Design System

Understanding the domain

About Manual Radiology

About Tele- Radiology

Processes at 5C Network

Products of 5C Network

Team of 5C Network



Radiology

Radiology, also known as diagnostic imaging, is a series of tests that take pictures or images of parts of the body. The field encompasses two areas — diagnostic radiology and interventional radiology — that both use radiant energy to diagnose and treat diseases. While there are several different imaging exams, some of the most common include x-ray, MRI, ultrasound, CT scan and PET scan.

A radiologist will look at the outcome of a certain imaging test to find a relevant image that evaluates and supports a diagnosis. These individuals are usually medical doctors (MDs) with highly specialized training focused on the interpretation of medical imaging. Radiologic technologists also aid in this process, as they use and manage the machines in the course of producing an image. After a patient undergoes imaging tests, radiologists will give reports of their interpretations to the referring clinical doctors.

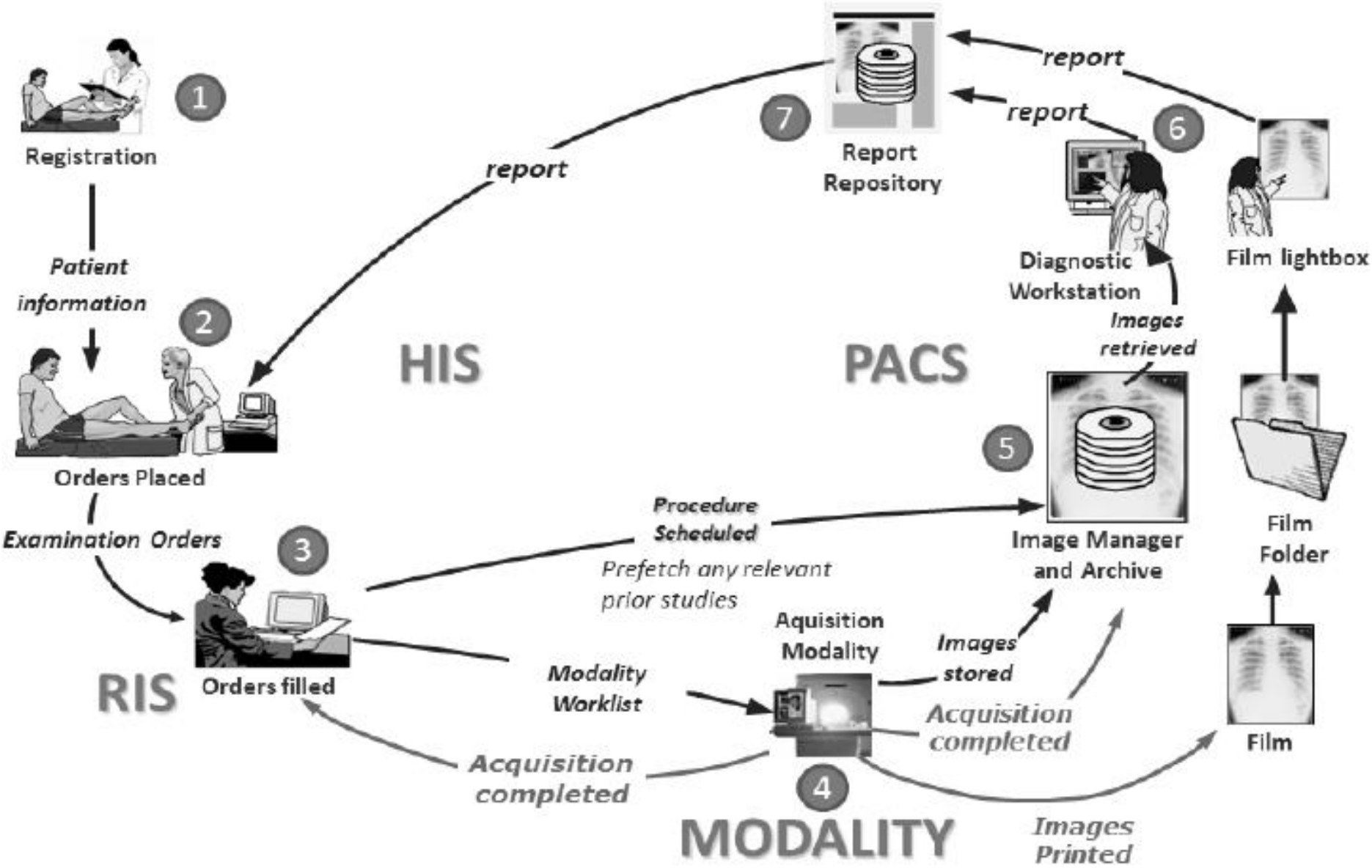


What Is Radiology Used for?

Radiology is used for a wide range of conditions, and is classified depending on the type of radiology and the exact imaging test used. The various imaging exams include:

- **Radiographs**: X-rays to look at bones, the chest or the abdomen.
- **CT (Computed Tomography):** A CT captures multiple x-ray angles of the patient using a doughnut-shaped machine, then creates computer-processed images.
- **MRI (Magnetic Resonance Imaging):** An MRI uses magnetic fields and radio waves with computer processing to create images.
- **Mammograms**: Specially powered x-rays that look at breast tissues.
- **Ultrasound**: An ultrasound uses sound waves to create moving images that display on a monitor, commonly used for echocardiograms and examining the womb during pregnancy.
- **Nuclear medicine:** These are short-acting radioactive substances that generate light from bodily processes. A camera collects the light, so a computer can process it and develop an imag.




1
Registration
Patient information
2
Orders Placed
Examination Orders
3
Orders filled
RIS
HIS
report
7
Report Repository
report
report
6
Diagnostic Workstation
Film lightbox
Images retrieved
PACS
5
Image Manager and Archive
Procedure Scheduled
Prefetch any relevant prior studies
Film Folder
Aquisition Modality
Images stored
Modality Worklist
Acquisition completed
Acquisition completed
4
MODALITY
Images Printed
Film



1- **Capturing Medical Images Through a Radiology Modality**

When a patient goes to the radiology department or a private radiology center with a prescription of the required scan, the patient should be well qualified before performing this scan to get the best possible images to facilitate the work of the radiologist which is giving the right diagnosis and report.

After qualifying the patient, the radiographer will be responsible for capturing the images of the required scan and according to the standard procedures of this scan, these images can be of multiple radiology techniques like using X-rays, CT scans, MRI scans, PET-CT, Mammography or any other type of imaging modalities.

2- Storing Medical Imaging Studies on a PACS System

In the modern radiology modalities that support DICOM functions, it can generate digital medical images in DICOM format which is primarily is temporarily stored in the local workstation related to the radiology modality.

Through a network communication, the radiology modality workstation can push the patient study to a picture archiving and communication system (PACS system) to archive the medical images with patient information.

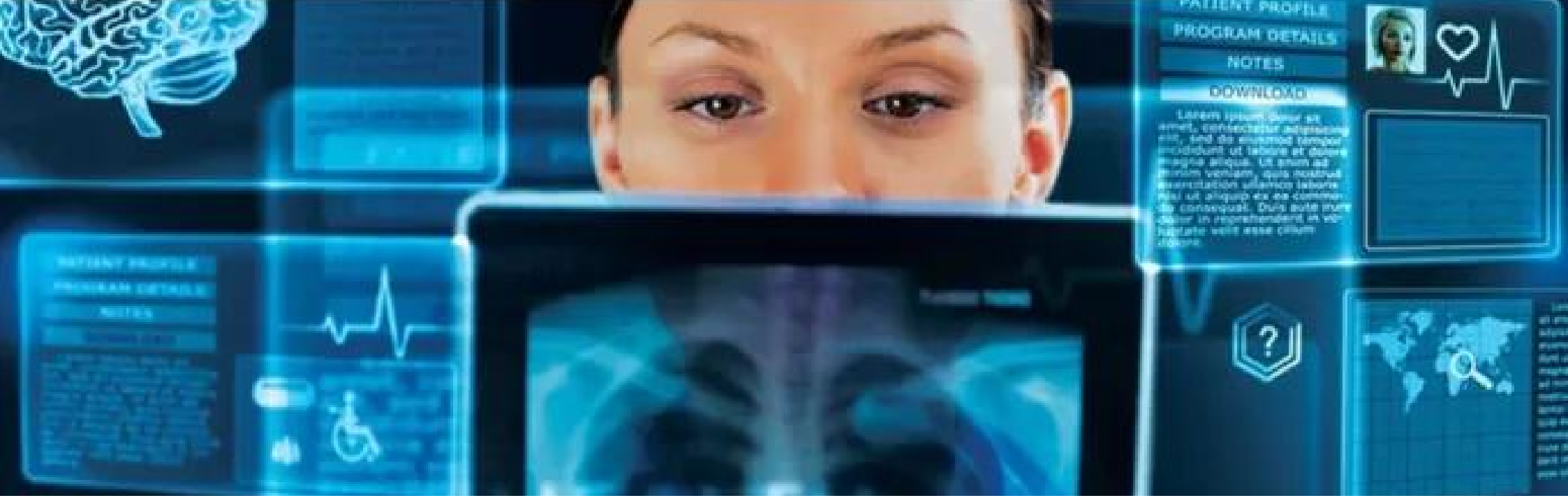
3- Forwarding Medical Imaging Studies to External Specialist for Diagnosis & Reporting.

A hospital or a private radiology center can contract with a radiology consultant who is not hired full time inside the facility itself and the consultant can be from anywhere, maybe from another city or from another country.

The distant radiology consultant is notified with the new patient studies to start accessing the PACS system through the internet with special credentials to start investigating the images and writing the patient report regarding these images.

4- Radiology Department Get Patient Report

After the consultant radiologist investigates the patient study, writes, and validates the diagnosis in the form of a report on the PACS system, the report is delivered to the patient or the referring physician to take the right action.


PATIENT PROFILE
PROGRAM DETAILS
NOTES
DOWNLOAD

The Flow of Tele - Radiology

1. **Patient**

Get and MRI scan/ Xray done in the diagnostic center

2. Technicians

The technician take the scans

3. Images via PACS

Technician sends the Images via PAC System

4. Radiologists

They analyze the symptoms and from the images and create a report

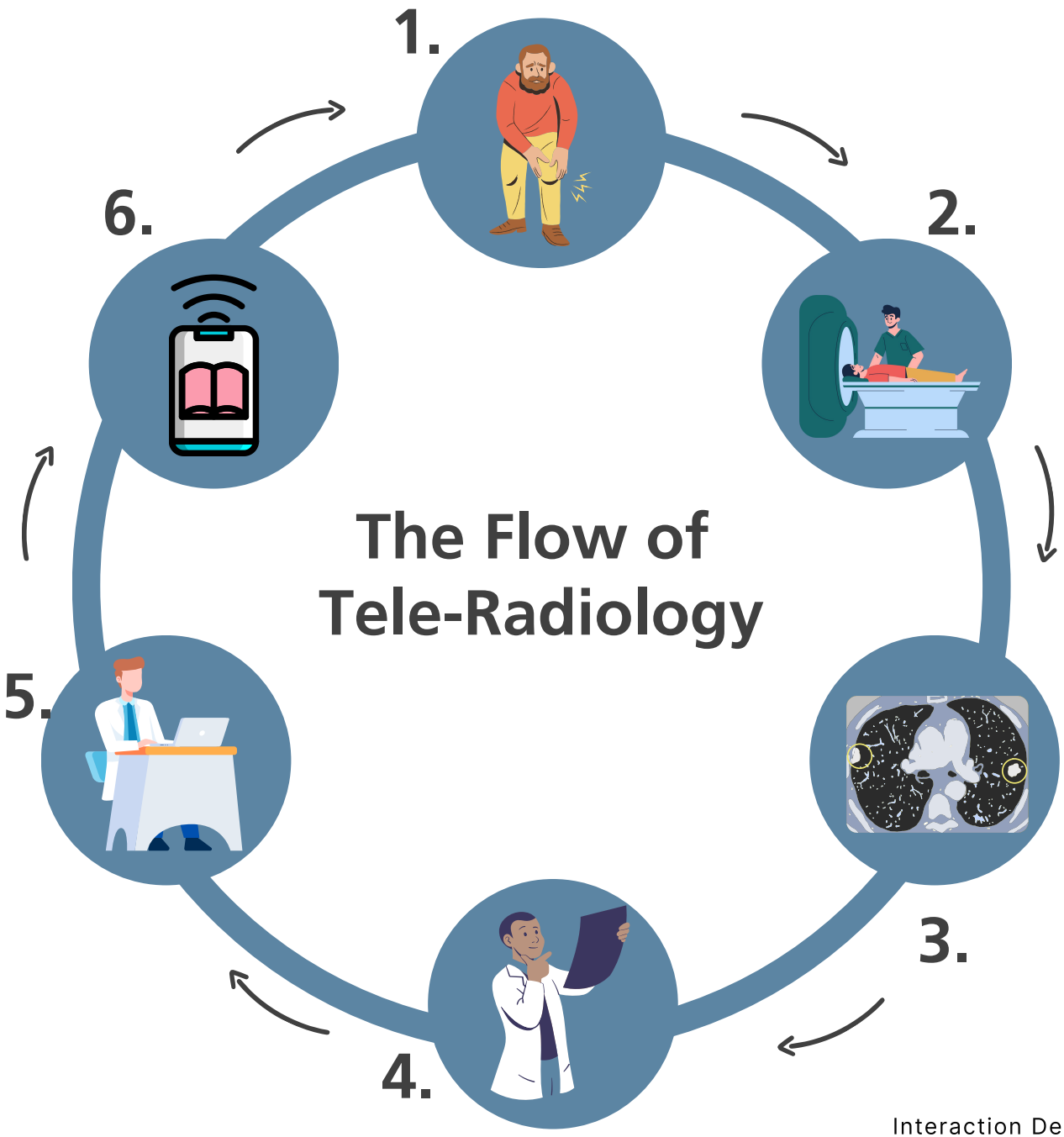
5. Physicians

The Physicians receives the signed report

6. Send report online

Send report to Diagnostic center online




1.
2.
3.
4.
5.
6.
The Flow of
Tele-Radiology



Shortage of Radiologists

Key Factors Contributing to the Radiology Shortage

- **Aging Population**

The increase in older demographics amplifies the demand for radiology services. Elderly individuals often require more medical imaging, increasing pressure on the already taxed radiology workforce.

- **Rising Demand for Imaging Services**

Advancements in medical technology have elevated imaging to a critical component of healthcare, leading to a demand-supply imbalance as the growth in these services outpaces the number of radiologists.

- **Retirement and Workforce Turnover**

Aging doesn't just boost the demand for radiology services, but it also impacts the supply. With older radiologists retiring, there is a concern about not having enough new professionals to fill the gap. Moreover, high turnover rates, often driven by burnout, worsen the radiologist shortage.

- **Limited Technological Solutions**

Artificial Intelligence promises to help mitigate the shortage by automating tasks. It has the potential to automate tasks, boost efficiency, and enhance accuracy in diagnosis. With AI, we can transform radiology services, enabling radiologists to manage their workload more effectively and possibly mitigating the impacts of the current shortage.

These factors, among others, create a complex challenge that the healthcare industry needs to address urgently to ensure the continued provision of high-quality imaging services.

Tele-Radiology

Radiology encompasses the diverse techniques used by medical professionals to capture images of the internal body to aid in the process of diagnosis or treatment. These imaging techniques can include X-ray imaging, computed tomography (CT), magnetic resonance imaging (MRI), and several others.
Teleradiology involves first obtaining medical images, following by the viewing and interpretation of these images for diagnostic or consultative purposes by a radiologist.

Teleradiology, which is a relatively recent practice, is becoming widely implemented by hospitals, urgent care clinics, and specialist imaging companies. The reason for its increased implementation is because teleradiology addresses the lack of adequate staff to provide radiological coverage, as well as the general lack of expertise in this specialty.
The process of teleradiology is based on an essential triad; an image sending station, a transmission network, and a receiving image station that must have a high-quality display screen that has been cleared for clinical purposes. In fact, there are now specialized computer programs that are dedicated to sending radiological images with the same ease associated with sending an email with image attachments.



Advantages of Tele-Radiology

- **Expert Access:**

Enables access to specialist radiologists who may not be available in less populated or remote areas, especially outside normal working hours

.

- **Enhanced Coverage:**

Supports hospitals with limited or no on-site radiology specialists, ensuring continuous radiological services.

- **Cost-Effective:**

Reduces the need for full-time on-site radiologists and leverages per-exam payment models with outsourcing companies.

- **Collaborative Care:**

Facilitates collaboration between medical professionals over large distances, improving diagnosis accuracy through specialist consultations and second opinions.

History of Tele-Radiology

The History of Teleradiology has undergone significant evolution driven by advancements in technology and regulatory changes.

- **Early Development**

Tele radiology traces its roots back to the 1960s when hospitals began experimenting with transmitting medical images via telephone lines. However, the technology was limited, and the images were of low quality.

- **Technological Advancements**

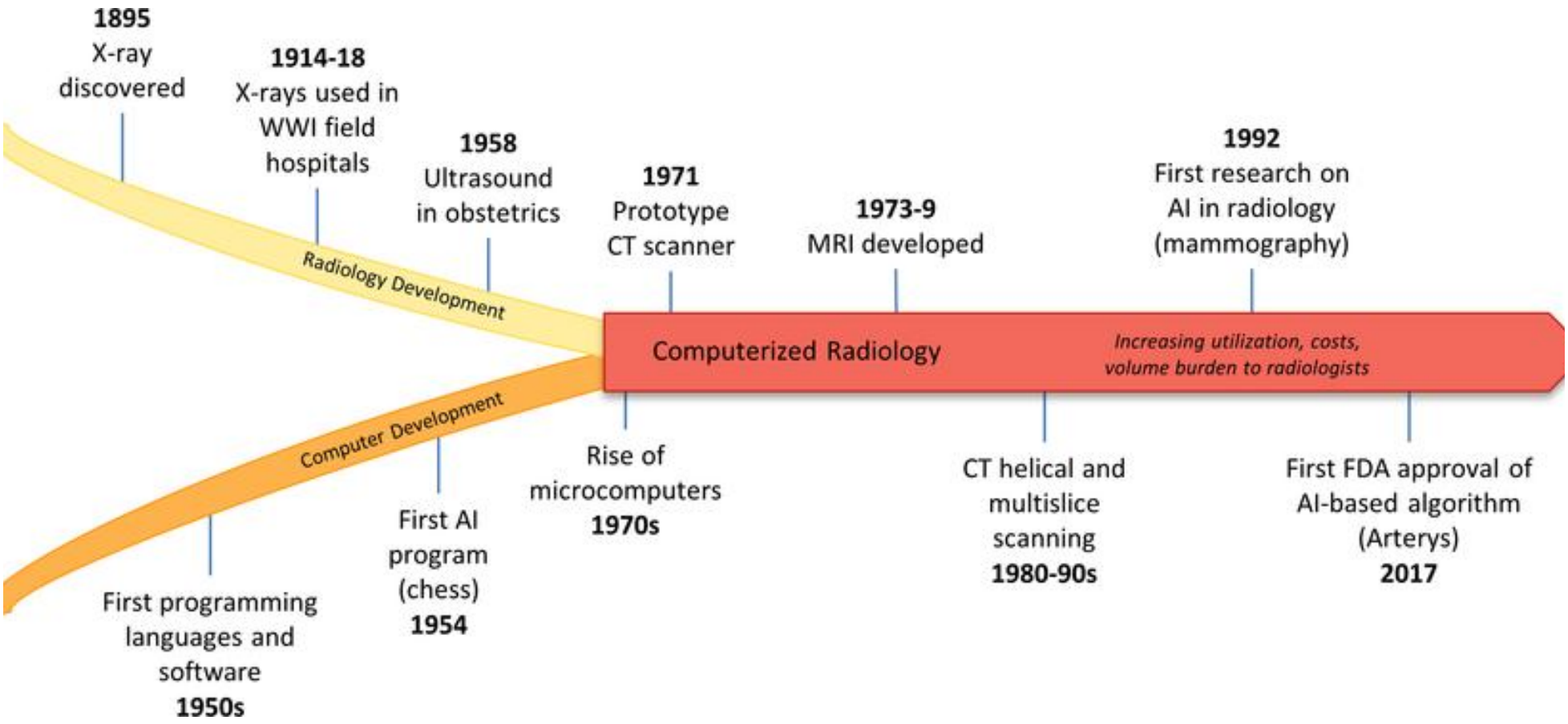
The development of digital imaging technologies in the late 20th century revolutionized teleradiology. Digital imaging modalities such as computed tomography (CT), magnetic resonance imaging (MRI), and digital radiography enabled the creation of high-quality medical images that could be easily transmitted over networks.

- **Internet and Telecommunication Infrastructure**

The widespread adoption of the internet and improvements in telecommunication infrastructure played a crucial role in the expansion of teleradiology. High-speed internet connections allowed for the rapid transmission of large medical image files, facilitating remote interpretation by radiologists located anywhere in the world.

- **Picture Archiving and Communication Systems (PACS)**

PACS emerged as a key technology in teleradiology. PACS enables the storage, retrieval, distribution, and presentation of medical images. It streamlines the workflow by providing radiologists with instant access to patient images from any location, making teleradiology more efficient and practical.


1895
X-ray discovered
1914-18
X-rays used in WWI field hospitals
1958
Ultrasound in obstetrics
1971
Prototype CT scanner
1973-9
MRI developed
1992
First research on AI in radiology (mammography)
Radiology Development
Computer Development
Computerized Radiology
Increasing utilization, costs, volume burden to radiologists
First programming languages and software
1950s
First AI program (chess)
1954
Rise of microcomputers
1970s
CT helical and multislice scanning
1980-90s
First FDA approval of AI-based algorithm (Arterys)
2017

What is PAC System?

Picture Archiving and Communication System (PACS) is a medical imaging technology used primarily in healthcare organizations. It provides economical storage, convenient access, and efficient management of images from multiple modalities (source devices).

Advantages PAC System?

- **Improved Accessibility**

- Remote

- **Enhanced Image Management**

- Efficient storage and easy retrieval

- **Cost Savings**

- Operational cost and film costs

- **Improved Diagnostic Accuracy**

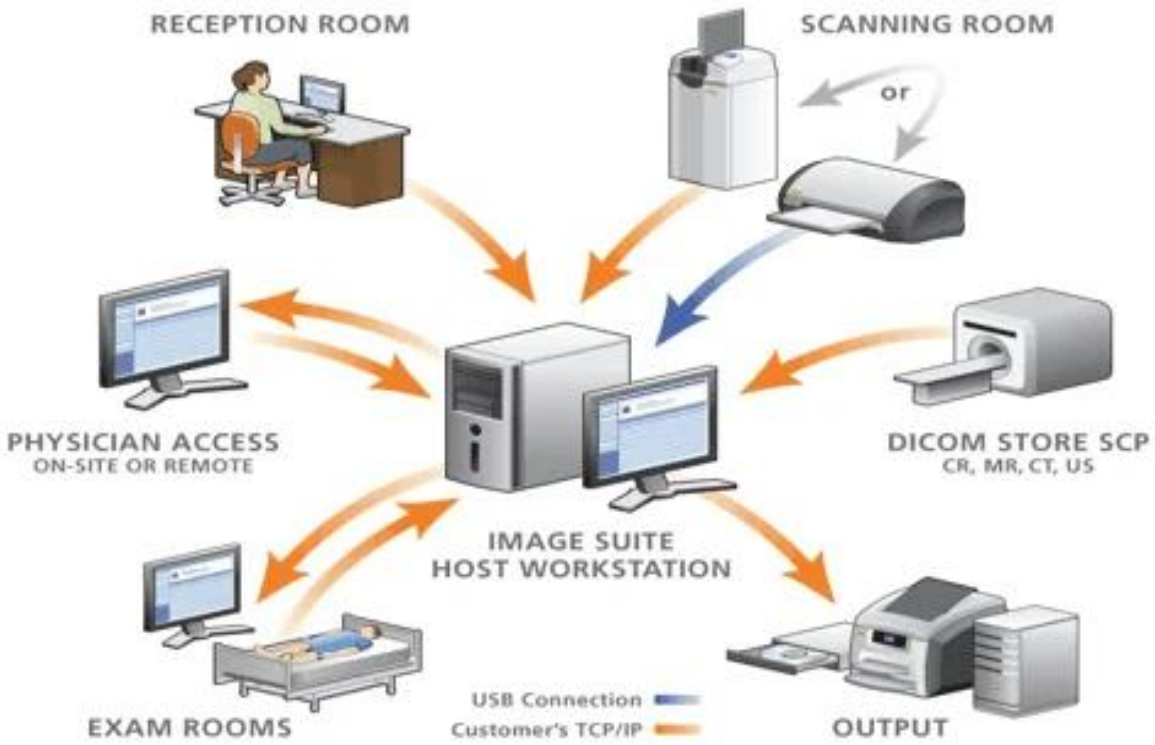
- Integration with AI

- **Enhanced Data Security**

-

- **Scalability and Flexibility**

-Customizable Solutions and scalable architecture



Artificial Intelligence is continuously revolutionising the medical domain. Since the 70s, many researchers have taken an interest in applying Artificial Intelligence in life sciences. Moreover, the modern AI aims to provide solutions for the practical healthcare problems. Emerging technologies such as deep learning have made a deep impact in healthcare, specifically when using AI in radiology.

Radiology is the area of medical science that uses radiation to generate medical imaging like X-ray, CT scans, Ultrasound and MRI images to discover abnormalities and tumours. AI algorithms can automatically detect complex anomalous patterns from the image data and assist patients in diagnosis.

According to the American Department of Radiology, AI adoption in radiology surged from 0 to 30% from 2015 to 2020.



Research

Products of the company

Business Model

Competitive Analysis



Products of the Company

1. Bionic Report
2. OsteoCheck
3. Chest R
4. Kronos



1. Bionic Report

Overview: The Bionic Report is a revolutionary AI-driven radiology reporting solution by 5C Network that combines advanced AI technologies with expert radiologist oversight to produce high-quality, accurate, and consistent radiological reports.

Features:

- **AI-Powered Quantification:** The AI algorithms quantify various aspects of the medical images, providing precise measurements and detailed analysis.
- **Consistency and Clarity:** Ensures that reports are consistent in format and language, reducing variability between different radiologists.
- **Enhanced Reporting:** Combines AI insights with radiologist expertise to create comprehensive reports that are both clinically relevant and easily interpretable.
- **Interactive Reports:** Provides interactive elements like annotated images and graphical representations of data, aiding in better understanding and communication.

Benefits:

- **Improved Diagnostic Accuracy**: Reduces human error and ensures precise measurements.
- **Efficiency** Streamlines the reporting process, allowing radiologists to focus on complex cases.
- **Faster Turnaround Times:** Accelerates the analysis and reporting process, leading to quicker diagnosis and treatment initiation.

Bionic Report



Select modality from here

Voice typing for writing reports ...

Hey Doc, I am here to assist you on reporting
Please write down the pathologies

Stretched Patella - Femoral Liagment

Oedema



Add Pathology

Create AI Report | Copy | Clear

Normal

Observations :

Impressions :

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-This Interface is Designed By me

2. OsteoCheck

Overview: OsteoCheck is an AI-driven tool specifically designed for assessing bone health and diagnosing osteoporosis. It leverages advanced imaging analysis to provide detailed insights into bone density and structure.

Features:

- Bone Density Measurement: Automatically measures bone mineral density (BMD) from radiographs or DEXA scans.
- Fracture Risk Assessment: Utilizes AI to predict the risk of fractures based on bone quality and other factors.
- Detailed Reporting: Generates comprehensive reports that include BMD scores, fracture risk, and actionable recommendations.

Benefits:

- Early Detection: Identifies osteoporosis and other bone health issues early, allowing for timely intervention.
- Personalized Care: Provides tailored treatment recommendations based on individual patient data.
- High Accuracy: Reduces variability and increases the accuracy of bone health assessments.

Osteo Check

Need Help ? +91-9566915477

Patient Information

Name	: Raj
Age	: 24
Sex	: Male
Phone Number	: 9944723484
Referring Doctor	: Dr.Vasavi

Download Report

< Back

Key Images

Right Knee



Findings

Reducing Joint Space	- No
Osteophytes	- No
Sclerosis	- No
Post-OP	- No
Alignment	- Normal
Soft Tissues	- Normal

No Abnormalities

Observation

- Visualized part of femur and tibia show normal density.
- No lytic/sclerotic lesion is seen.
- Joint spaces between medial and lateral tibio-femoral compartments and patella-femoral compartment are maintained.
- No obvious abnormality is seen in the soft tissues.

3. Chest R

Overview: Chest R is an AI-powered solution focused on the analysis of chest radiographs, aimed at improving the detection and diagnosis of various chest-related conditions.

Features:

- **Condition Detection:** Identifies conditions such as lung nodules, tuberculosis, pneumonia, and other abnormalities in chest X-rays.
- **Quantification of Abnormalities:** Automatically quantifies the extent of abnormalities, providing precise measurements and analysis.
- **Visual Annotations:** Generates reports with visual annotations on the radiographs, highlighting areas of concern.

Benefits:

- **Accurate Diagnosis:** Enhances the accuracy of diagnosing chest conditions, reducing the likelihood of missed diagnoses.
- **Efficiency**: Streamlines the analysis process, allowing for faster and more reliable reporting.
- **Support for High-Volume Settings:** Particularly useful in settings with high volumes of chest X-rays, ensuring consistent and accurate analysis.

5C



Chestr Reports

Search

+ ADD

Patient Name	Age / Sex	Date	Referred By	Report
kathir	Male / 32	2024-06-29	dr kani	View
james	Male / 40	2024-06-29	dr kani	View
wemby	Male / 37	2024-06-29	dr kani	View
john	Male / 31	2024-06-29	dr kani	View
kiran	Male / 33	2024-06-29	dr kani	View
kiran	Male / 22	2024-06-29	dr kani	View
Test001	Male / 23	2024-07-02	Dr. B	View
Mahesh S	Male / 31	2024-07-03	Dr.	View
Mahesh S	Male / 31	2024-07-03	Dr.	View
tamil	Male / 43	2024-07-04	dr kani	View
test7	Male / 35	2024-07-05	Dr K	View

4. Kronos

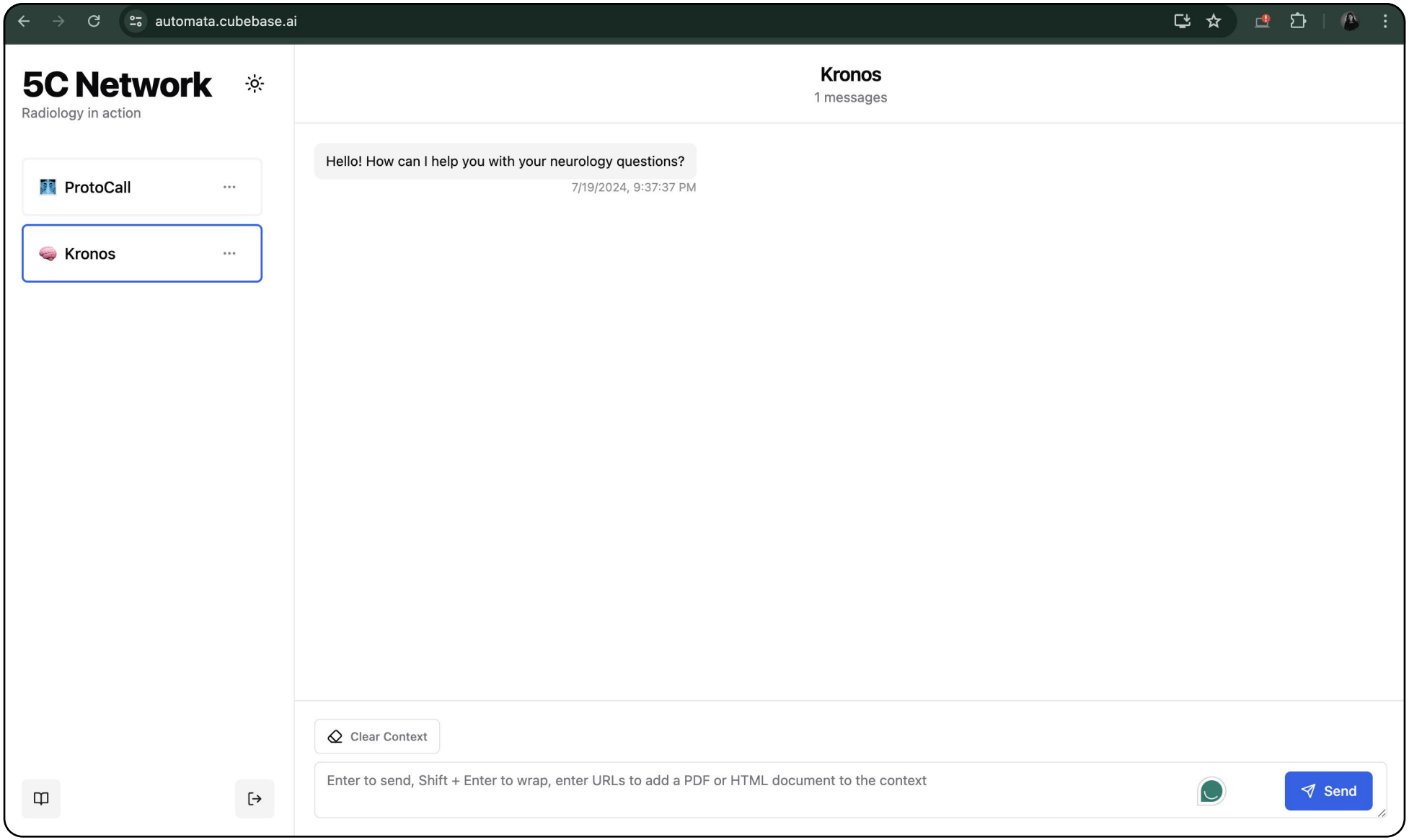
Overview: Kronos is a specialized AI tool for the analysis of neurological images, designed to aid in the diagnosis and management of various neurological conditions.

Features:

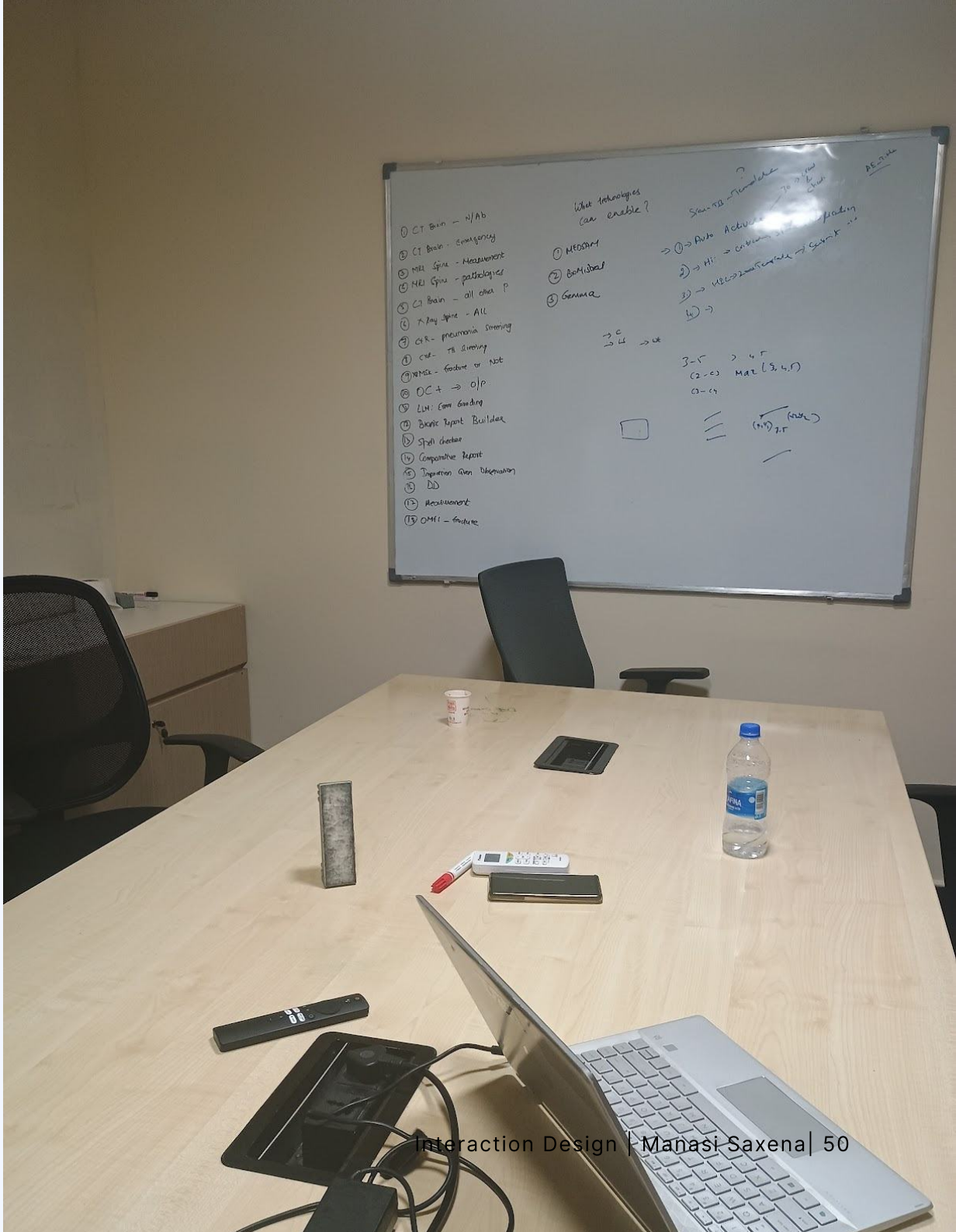
- **Condition Detection:** Detects neurological conditions such as stroke, brain tumors, and multiple sclerosis using advanced image processing algorithms.
- **Volumetric Analysis:** Performs automated volumetric analysis of brain structures, providing detailed information about brain morphology.
- **Comprehensive Reporting:** Generates detailed reports with visual annotations and quantitative data to support clinical decision-making.

Benefits:

- **Enhanced Diagnostic Accuracy:** Improves the detection of subtle neurological abnormalities that might be missed by the human eye.
- **Early Detection and Treatment:** Supports early diagnosis and timely intervention, improving patient outcomes.
- **Efficiency**: Reduces the time required for analyzing complex neurological images.


automata.cubebase.ai
5C Network
Radiology in action
ProtoCall
Kronos
Kronos
1 messages
Hello! How can I help you with your neurology questions?
7/19/2024, 9:37:37 PM
Clear Context
Enter to send, Shift + Enter to wrap, enter URLs to add a PDF or HTML document to the context
Send

Competitive Analysis


What technologies can enable?

Sr No.	Parameters	Crelio Health	Rad AI
1	**Target Market**	Diagnostics labs and healthcare facilities with a need for integrated lab and radiology management.	Radiologists and healthcare providers seeking to enhance reporting efficiency with AI.
2	**Geographic Reach**	Strong presence in India and emerging markets.	Focused on markets with advanced healthcare infrastructure, primarily in developed countries.
3	**Market Positon**	Established player in diagnostic lab management, less focused on specialized radiology solutions.	Leading in AI-driven radiology enhancements, known for reducing radiologist workload.
4	**Competitive Advantage**	Integrated diagnostic management system covering lab and radiology services, patient portal accessibility.	Advanced AI and NLP for automation, significant reduction in reporting time, and seamless PACS/RIS integration.
5	**AI Powered Reporting**	No – Primarily a diagnostic management system with basic reporting capabilities.	Yes – AI and NLP for automated report generation and error detection.
6	**Voice-to-Text Conversion**	No	Yes - but not accurate
7	**Templates**	Limited	Limited
8	**Workflow Integration**	Yes – Integrated within a broader diagnostic management platform.	Yes – Integrates with PACS and RIS systems.

Rology	Braid
Healthcare providers and radiologists needing remote teleradiology services.	Radiologists and healthcare facilities looking for AI-powered diagnostic tools and collaborative features.
Global reach, focusing on regions with high demand for teleradiology services.	Primarily in regions with advanced healthcare infrastructure, with plans for expansion.
Well-established in the teleradiology space with a strong network of radiologists.	Known for robust AI technology, focusing on diagnostic accuracy and efficiency.
24/7 reporting services, rapid turnaround times, and strong quality assurance processes.	AI-driven diagnostics, real-time collaboration tools, and a focus on streamlined processes.
No – Relies on human radiologists for report generation.	Yes – AI-driven diagnostics enhance accuracy and efficiency.
No	No
No – Standard reporting templates provided.	No
Yes – Integration with healthcare provider systems for remote reporting.	Yes – Real-time collaboration and secure messaging.

Sr No.	Parameters	Crelio Health	Rad AI
9	**Collaboration tool**	No	Limited
10	**Additional Features**	Integration with various lab equipment, comprehensive patient management, and multi-language support.	Advanced error detection algorithms, seamless PACS/RIS integration, and significant time savings for radiologists.
11	**Split screen for reporting**	No	Yes
12	**Patient portal**	Yes – Comprehensive patient portal for accessing lab and radiology reports.	Leading in AI-driven radiology enhancements, known for reducing radiologist workload.
13	**Template Categorization**	Limited with basic templates	No
14	**Import own templates**	No	No
15	**Advance search filters**	No	Yes - Advanced search filters to efficiently navigate through reports and cases.

Rology	Braid
Limited – Primarily focuses on individual radiologist efficiency.	Yes – Offers collaboration through teleradiology network.
24/7 reporting capabilities, rapid emergency reporting, and strong quality assurance processes.	Robust AI technology, streamlined processes, and focus on collaborative diagnostics.
No – Focuses on teleradiology services, does not emphasize split-screen functionality.	Yes – Includes split-screen functionality for simultaneous viewing and reporting, enhancing user experience.
No – Focused on radiologist and healthcare provider interaction.	No – Primarily aimed at radiologists and healthcare facilities.
No – Focused on radiologist and healthcare provider interaction.	No
No – Uses standard templates provided by the platform.	Yes – Users can import and customize their own templates, enhancing flexibility.
Limited – Basic search functionalities for finding reports within the teleradiology network.	Yes – Advanced search filters for streamlined navigation and retrieval of reports and cases.

Research Analyzing

Interviewes

Insights

Major Insights

Gain Points

Pain Points



Insights

"How Might We" (HMW) statements mighty questions that allow us to reframe our insights into opportunity areas and innovate on problems found during user research.

Bar bar Manually report banane mein bahut time lagta hai. Agar yeh automated ho jaye toh bahut aasan ho jaye. (A lot of time is spent on manual report building If this becomes automated, it will be much easier.)

"Hamare imaging software purane hain, image load karne aur render karne mein slow hain. Kuch Naye technology ke integration mein bhi issues hain." (Our imaging software is outdated, and it’s slow in loading and rendering images. There are also issues in integrating new technology.)

"Manual transcription ke wajah se diagnostic reports mein errors ho sakte hain. Humein accurate aur reliable dictation tools ki zarurat hai." (Due to manual transcription, there can be errors in diagnostic reports. We need accurate and reliable dictation tools.)

"Stenographers ya transcription services maintain karna costly hai. Humein cost-effective solutions chahiye jo resources ko optimize kar sake." (Maintaining stenographers or transcription services is costly. We need cost-effective solutions that can optimize resources.)

"Solutions jo smoothly existing hospital systems ke sath integrate ho jayein, manual data entry ko kam karke workflows ko efficient banate hain." (Solutions that smoothly integrate with existing hospital systems reduce manual data entry and make workflows efficient.)

QUOTES

Major Insights

Diagnostic Precision:

- Radiologists are highly focused on accuracy and precision in their diagnostic reports.
- Advanced imaging tools and technologies that enhance diagnostic accuracy are greatly valued.

Workflow Efficiency

- There is a strong demand for solutions that streamline workflow and reduce time spent on manual tasks.
- Integration with existing hospital systems is crucial for maintaining efficient workflows.

Advanced Tools and Technology

- Radiologists seek access to specialized tools that aid in complex diagnostic scenarios.
- User-friendly and intuitive software interfaces are important for efficient diagnosis.

Collaboration and Communication:

- Effective collaboration with other healthcare professionals is essential for comprehensive patient care.
- Tools that facilitate easy communication and data sharing are highly beneficial.

Professional Development

- Continuous learning and staying updated with advancements in radiology are priorities.
- Radiologists value feedback from peers and IT professionals to improve their practice.

Gains Points

Improved Efficiency

- Streamlined report generation and data management processes save time and reduce administrative burdens.
- Automated routine tasks like data searching, filtration, and template creation free up radiologists' time.

Seamless Integration

- Solutions that integrate smoothly with existing hospital systems maintain efficient workflows and reduce manual data entry.
- Advanced tools that provide detailed visualizations aid in complex diagnostic scenarios.

Cost Savings

- Cost-effective solutions reduce operational costs associated with report generation and resource management.
- Optimized resource utilization leads to better overall efficiency.

Better Collaboration

- Tools that facilitate real-time communication and seamless data sharing enhance collaboration among multidisciplinary teams.
- Improved teamwork leads to comprehensive patient care and better treatment outcomes.

Professional Growth

- Integration of educational tools and resources into daily workflows supports continuous learning.
- Staying updated with the latest advancements in radiology enhances professional development and practice quality.

Pains Points

Time-consuming Reporting Processes

- Significant time is spent on manual report building, template creation, and searching/filtering data.

Technical Limitations

- Outdated imaging software leads to slow performance in image loading and rendering.
- Integration challenges with new technologies disrupt workflows.

Accuracy and Errors:

- Potential for errors in diagnostic reports due to technical limitations or manual transcription.
- Need for reliable and accurate dictation and transcription tools.

Cost and Resource Management

- High costs associated with maintaining stenographers or transcription services.
- Desire for cost-effective solutions that optimize resource utilization.

User Experience

- Complex interfaces and inefficient software navigation slow down the diagnostic process.
- Difficulty in switching between tabs or screens during report generation decreases productivity.

Persona and Empathy Mapping 1



Bio:
Dr. Anuj Shah, Aged 45, Practices General Radiology In Mumbai, India, With Over 20 Years Of Experience. He Works At A Large Metropolitan Hospital, Handling A Diverse Range Of Diagnostic Cases And Collaborating With Various Medical Specialties.

Motivation: Driven By A Commitment To Providing Accurate And Timely Diagnostic Services, Dr. Shah Aims To Leverage Technology To Enhance Efficiency And Improve Patient Care Outcomes.

Personality: Analytical And Pragmatic | Systematic Approach | Empathy

Pain Points:

1. Time Spent On Searching And Filtration: Dr. Shah Finds It Frustrating To Spend Valuable Time Searching For Specific Patient Data Or Filtering Through Large Volumes Of Imaging Studies.
2. Performance Issues: Faces Slow Performance Issues With Image Loading And Rendering, Particularly In Complex Diagnostic Cases.
3. Technical And Integration Challenges: Encounters Difficulties With The Integration Of New Tools Into Existing Hospital Systems, Leading To Workflow Disruptions.

Gain Points:

1. Improved Workflow Efficiency: Desires A Solution That Simplifies Data Retrieval And Enhances Efficiency In Report Generation And Data Management.
2. Enhanced Visualization Tools: Seeks Advanced Imaging Tools That Offer Clear, Detailed Visualizations, Especially In Challenging Diagnostic Scenarios.
3. Cost Efficiency: Values Solutions That Reduce Operational Costs Associated With Transcription Services And Improve Overall Resource Utilization.

Frustrations:

1. Manual Report Building: Finds Manual Report Building And Template Creation Time-Consuming And Inefficient.
2. Limited Accessibility: Faces Challenges With Accessibility To Specialized Tools And Advanced Imaging Capabilities That Could Aid In Precise Diagnostics.
3. Integration Issues: Frustrated By Technical Limitations And Compatibility Issues When Attempting To Integrate New Software Or Tools Into The Hospital's Existing Infrastructure.

Thinks :

Analyzing ways to streamline his diagnostic workflow and improve efficiency in patient care.

Feels:

Frustrated by technical challenges and inefficiencies that hinder his ability to deliver timely and accurate diagnoses.

Saying and Hearing:

- Expresses frustration with slow performance and integration challenges of current imaging software.
- Seeks feedback from colleagues and IT administrators on potential solutions to enhance workflow efficiency.

Seeing:

- Views a diverse range of diagnostic cases, from routine screenings to complex diagnostic challenges.
- Recognizes the importance of clear and detailed imaging studies in supporting accurate diagnoses.

Doing:

- Actively searches for patient data and filters through imaging studies to extract relevant information.
- Engages in continuous professional development to stay updated with advancements in radiology technology.

Pain Points:

- Time-consuming report building and template creation.
- Frustration with technical limitations and slow performance of imaging software.
- Desire for specialized tools that integrate seamlessly with existing systems.

Gain Points:

- Improved efficiency in report generation and data management.
- Access to advanced analytical tools for precise oncological imaging.
- Enhanced collaboration with oncologists and other healthcare professionals.

Persona and Empathy Mapping 2

"How Might We" (HMW) statements mighty questions that allow us to reframe our insights into opportunity areas and innovate on problems found during user research.



Bio:
Dr. Neha Kapoor is a 38-year-old radiologist based in delhi, india. she specializes in oncological radiology and has been practicing for 15 years. dr. kapoor works at a renowned cancer hospital, where she handles complex cases and collaborates closely with oncologists and surgeons.

Motivation: Dr. Kapoor Is Deeply Motivated By The Impact Of Her Work On Patient Outcomes. She Strives For Accurate Diagnoses And Timely Reporting To Support Effective Treatme Planning For Cancer Patients.

Personality: Detail-Oriented And Meticulous | Values Precision | Empathy

Pain Points:

1. Time-Consuming Report Building: Dr. Kapoor Spends Considerable Time Creating Detailed Reports And Templates, Which Can Be Repetitive And Tedious.
2. Technical Limitations: Faces Challenges With Outdated Imaging Software, Resulting In Slow Image Loading And Rendering, Especially In Complex Oncological Cases.
3. Lack Of Specialized Tools: There Is A Noticeable Absence Of Advanced Disease-Specific Analysis Tools That Integrate Seamlessly With Existing Systems, Hindering Precise Diagnostics.

Gain Points:

1. Enhanced Diagnostic Accuracy: Desires Tools That Improve Accuracy In Diagnosing Cancer And Monitoring Treatment Responses.
2. Efficient Workflow: Seeks A Solution That Streamlines Reporting Tasks And Integrates Smoothly With Hospital Systems, Reducing Administrative Burdens.
3. Advanced Analytical Capabilities: Values Access To Specialized Tools That Aid In Complex Oncological Imaging And Analysis.

Frustrations:

1. Switching Tabs During Reporting: Finds It Frustrating To Switch Between Different Tabs Or Screens While Generating Reports, Disrupting Workflow And Concentration.
2. Inaccurate Audio Typing: Faces Challenges With Inaccurate Audio Typing Tools Or The Unavailability Of Such Tools, Leading To Errors In Report Dictation.
3. Communication Issues: Struggles With Communication Problems When Relying On Typists Or Stenographers For Report Transcription, Which Can Delay Report Delivery And Introduce Errors

Thinks :

Concerned about the accuracy of her diagnostic reports.

Feels:

Empathetic towards her patients' and driven by a strong sense of responsibility

Saying and Hearing:

- Expresses concerns about the need for more advanced tools to improve diagnostic accuracy.
- Seeks feedback from oncologists and colleagues on the clarity and usefulness of her reports.

Seeing:

- Views patients undergoing challenging treatments, often witnessing their resilience and the impact of accurate diagnoses on their treatment outcomes.
- Sees the complexity of imaging studies and the critical role of detailed reports in guiding oncologists' treatment decisions.

Doing:

- Spends long hours analyzing imaging scans and writing detailed reports.
- Actively participates in multidisciplinary meetings to discuss patient cases and treatment plans.

Pain Points:

- Difficulty in managing reports without a stenographer, leading to potential errors and inefficiencies.
- Limited template options for specific and complex radiology reports.
- Communication with Typists: Experiences communication barriers and inconsistencies with typists, affecting transcription quality.

Gain Points:

- Advanced diagnostic tools and AI reduce errors and improve imaging analysis.
- Standardized templates and voice recognition streamline the reporting process.
- Reduced workload and positive feedback boost confidence, trust, and professional standing.

How Might We Statements

How might we streamline the report generation process to reduce manual tasks and improve efficiency for radiologists like Dr. Neha Kapoor and Dr. Anuj Shah?

How might we leverage AI and machine learning technologies to automate routine tasks like data searching, filtration, and template creation, freeing up radiologists' time for more critical decision-making tasks?

How might we create intuitive interfaces and user-friendly tools that facilitate faster and more accurate diagnoses, improving the user experience for radiologists dealing with complex cases?

How might we develop advanced imaging software that enhances diagnostic precision and integrates seamlessly with existing hospital systems, addressing the technical limitations faced by radiologists?

How might we enable better collaboration and communication among multidisciplinary healthcare teams by developing tools that facilitate seamless data sharing and real-time collaboration?

How might we provide cost-effective solutions that optimize resource utilization and reduce operational costs associated with maintaining outdated imaging software and hardware?

How might we reduce the reliance on costly transcription services by implementing accurate and efficient dictation and transcription tools, ensuring reliable and error-free report generation for radiologists?

Journey Mapping

Journey phase	Discovery	Consideration
Scenario	Dr. Kapoor attends a webinar about radx, where she learns about its automated report creation and advanced search capabilities. intrigued, she decides to explore further by visiting the website and reading reviews from other users.	After the webinar, Dr. Kapoor Requests a demo of RadX. during the demo, she is impressed by the streamlined interface and accurate audio typing features. she decides to start a trial period to see how it fits into her daily workflow.
Actions	• **Discovering RadX:** dr. kapoor comes across radx through an online webinar highlighting its features and benefits. • **Initial Research:** she visits the radx website, reads about its functionalities, and watches introductory videos. • **Feedback And Reviews:** she looks up reviews and feedback from other radiologists who have used radx.	• **Demo Request:** Dr. Kapoor signs up for a demo to explore radx's functionalities. • **Consultation**: She schedules a call with a radx representative to discuss specific pain points and how RadX can address them. • **Trial Period**: Dr. Kapoor starts a trial period to evaluate radx's performance in her daily workflow.
Emotion	 • **Curiosity**: interested in how radx can improve her workflow. • **Skepticism**: unsure if radx can deliver on its promises.	 • **Hopeful**: Optimistic that radx could significantly improve her workflow. • **Apprehensive**: Worried about the implementation process and potential disruptions.
Thoughts	• "This software claims to automate report creation. that could save me a lot of time." • "If RadX really has advanced search functions, it would solve my patient data retrieval issues."	• The Demo Was Impressive, But Will It Work Seamlessly With My Current Systems?" • "The Cost Savings From Accurate Audio Typing Could Be Substantial."
Touchpoints	• Online webinar • RadX website • Introductory videos • Reviews and feedback platforms	• RadX Demo • Consultation Call With RadX Representative • Trial Version Of RadX Software

Decision	Implementation	Evaluation and Iteration
Dr. Kapoor compares RadX with other radiology reporting tools. after a thorough cost-benefit analysis, She decides to subscribe to radx, convinced by its potential to save time and reduce costs.	Dr. Kapoor undergoes comprehensive training sessions to get familiar with RadX. She then integrates the tool into her existing workflow, gradually shifting from her previous system to RadX.	After using RadX for a few months, Dr. Kapoor reviews its performance and notes significant time savings and cost reductions. She provides feedback to the RadX team for further improvements and continues to optimize her workflow with their support.
• **Comparison**: Dr. Kapoor compares RadX With other solutions in the market. • **Cost-Benefit Analysis**: She performs a cost-benefit analysis to determine the financial viability of switching to RadX. • **Decision Making:** Dr. Kapoor decides to subscribe to radx based on its potential to save time, reduce costs, and improve reporting accuracy.	• **Onboarding**: Dr. Kapoor undergoes onboarding and training sessions provided by RadX. • **System Integration:** She Integrates RadX with her existing systems and workflows. • **Initial Usage**: Dr. Kapoor Starts Using RadX For Her Daily Reporting Tasks, Gradually Transitioning From Her Old System.	• **Performance Review**: Dr. Kapoor periodically reviews RadX's performance, noting improvements and any issues encountered. • **Feedback**: She provides feedback to the RadX Support team regarding any problems or suggestions for improvement. • **Iteration**: Dr. Kapoor works with RadX to iterate and optimize the software based on her feedback.
 • **Confident**: Feels confident in her decision to choose RadX. • **Relieved**: Relieved At the prospect of overcoming her current workflow challenges	 • **Optimistic**: Positive about the potential improvements in her workflow. • **Anxious**: Slightly anxious about the transition period and potential teething problems.	 • **Satisfied**: Happy with the improvements in efficiency and cost savings. • **Proactive**: Actively engaged in providing feedback to ensure continuous improvement.
• "RadX Offers More Features Tailored To My Needs Than The Other Solutions." • "The Potential Time And Cost Savings Justify The Investment."	• "The training was thorough. i feel ready to use radx." • "I hope the integration process goes smoothly without any major issues."	• "RadX has significantly reduced my reporting time. I'm glad I made the switch." • "There Are A Few Areas For Improvement, But Overall, It's A Great Tool."
• Product Comparison Tools • Financial Analysis Tools • Subscription Service	• Onboarding Sessions • Training Programs • Integration Support	• Performance Review Meetings • Feedback Submission Platforms • Continuous Support And Updates From RadX Team



Define and Ideate

Storyboarding

Problem Statement

Key Issues

Ideations

Pain Points



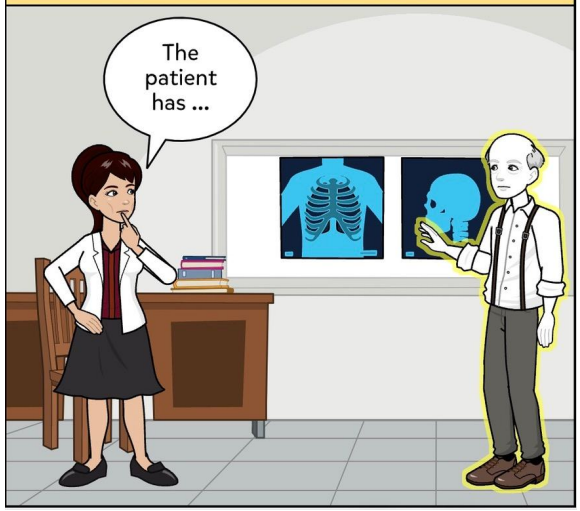
1

Meet Dr. Neha Kapoor, an experienced oncological radiologist.



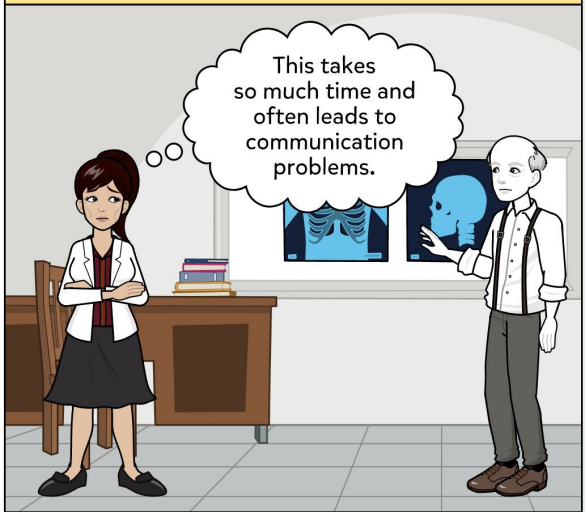
2

Dr. Kapoor relies on a typist for report transcription. She started tell what to write in a report



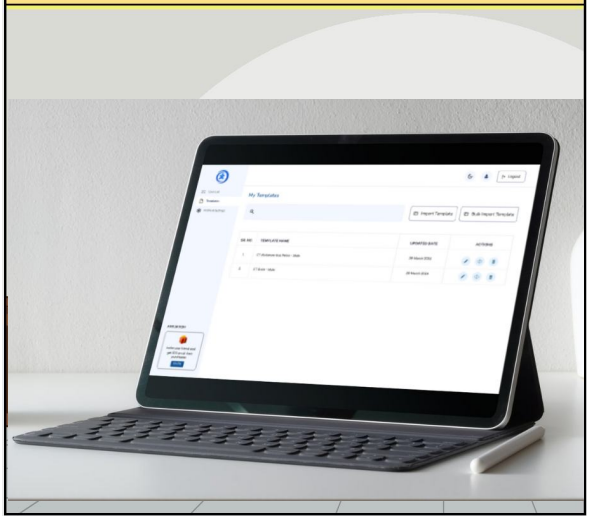
3

Dr. Kapoor reviewed the report with errors, looking frustrated.



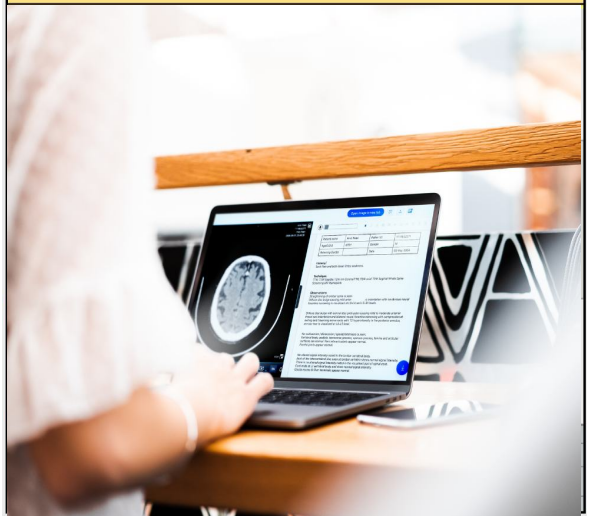
7

Pre-built templates and spell-check features eliminate manual errors.



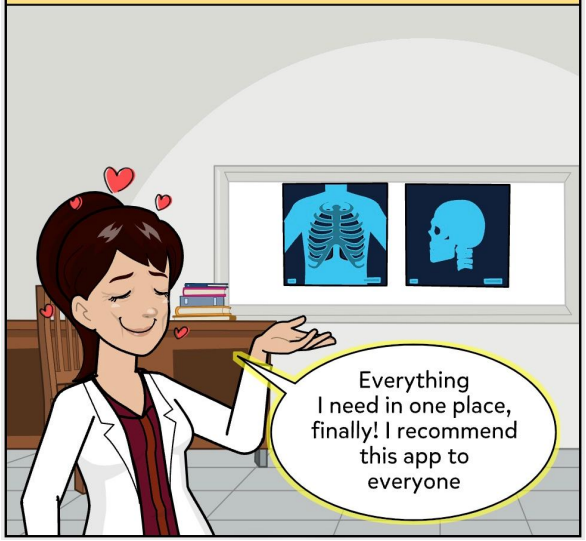
8

RADX integrates seamlessly, reducing the need to switch screens.

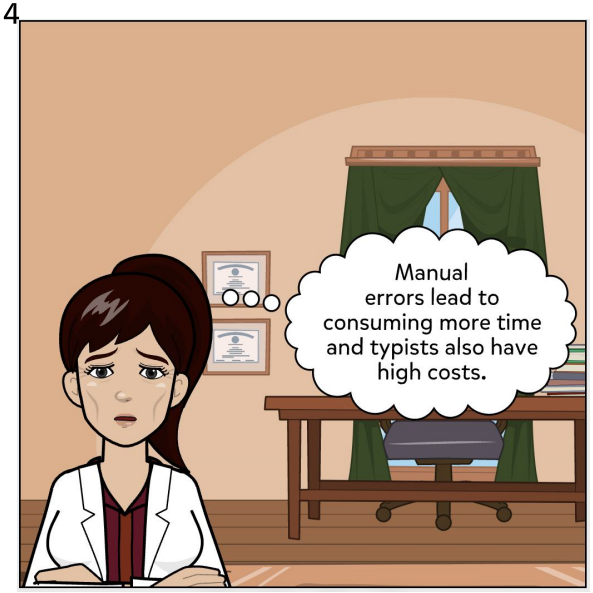


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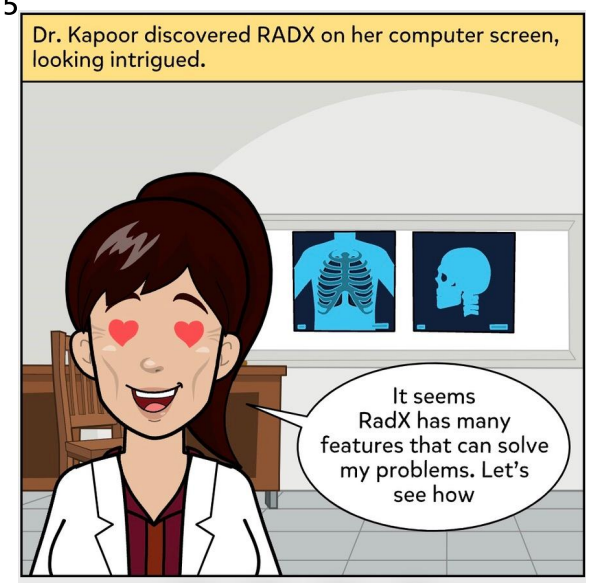
Dr. Kapoor confidently finalized a report on RADX.



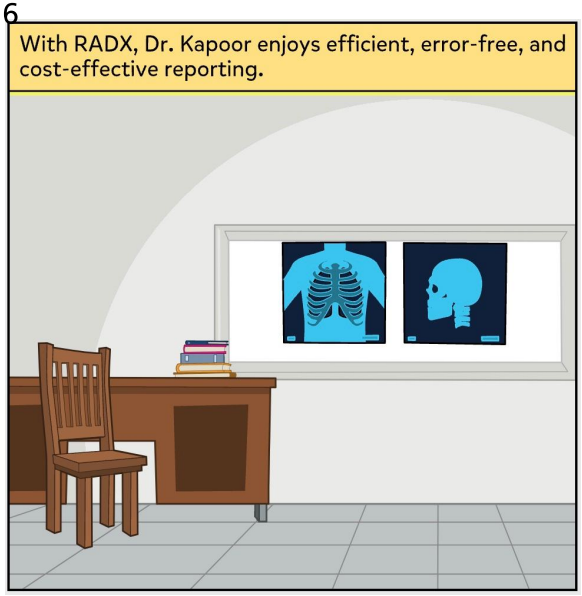
4


Manual errors lead to consuming more time and typists also have high costs.

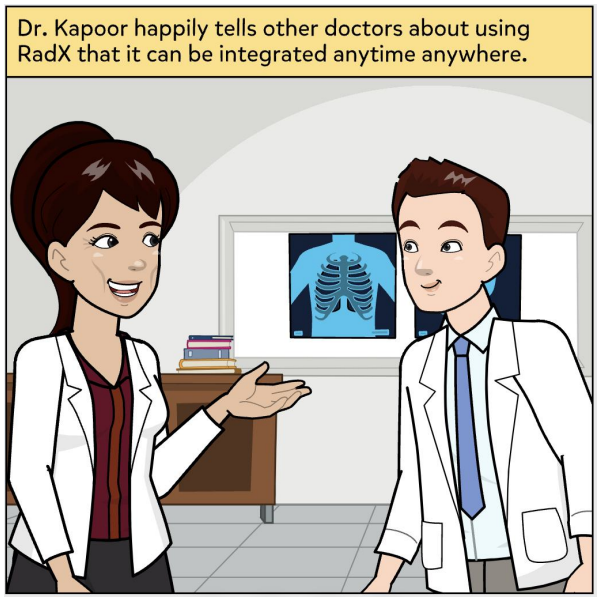
5


Dr. Kapoor discovered RADX on her computer screen, looking intrigued.
It seems RadX has many features that can solve my problems. Let's see how

6


With RADX, Dr. Kapoor enjoys efficient, error-free, and cost-effective reporting.

10


Dr. Kapoor happily tells other doctors about using RadX that it can be integrated anytime anywhere.



Problem statement

Radiologists are highly focused on accuracy and precision in their diagnostic reports, yet they face significant challenges due to time-consuming manual processes, technical limitations, and inefficient software interfaces. Advanced imaging tools and technologies are valued for enhancing diagnostic accuracy, but outdated systems and poor integration with existing hospital infrastructure often hinder workflow efficiency. Effective collaboration and communication with other healthcare professionals are essential for comprehensive patient care, yet current tools for data sharing and real-time communication are inadequate. Additionally, there is a strong need for continuous professional development, with radiologists seeking access to specialized tools and educational resources to stay updated with advancements in their field.

Key Issues

1. Time-consuming Reporting Processes:

- Manual report building, template creation, and data searching/filtering take up significant time, reducing productivity.

2. Technical Limitations:

- Outdated imaging software leads to slow performance in image loading and rendering, disrupting workflow efficiency.
- Integration challenges with new technologies further disrupt workflows.

3. Accuracy and Errors:

- Potential for errors in diagnostic reports due to technical limitations or manual transcription.
- Need for reliable and accurate dictation and transcription tools.

4. Cost and Resource Management:

- High costs associated with maintaining stenographers or transcription services.
- Desire for cost-effective solutions that optimize resource utilization.

5. Collaboration and Communication:

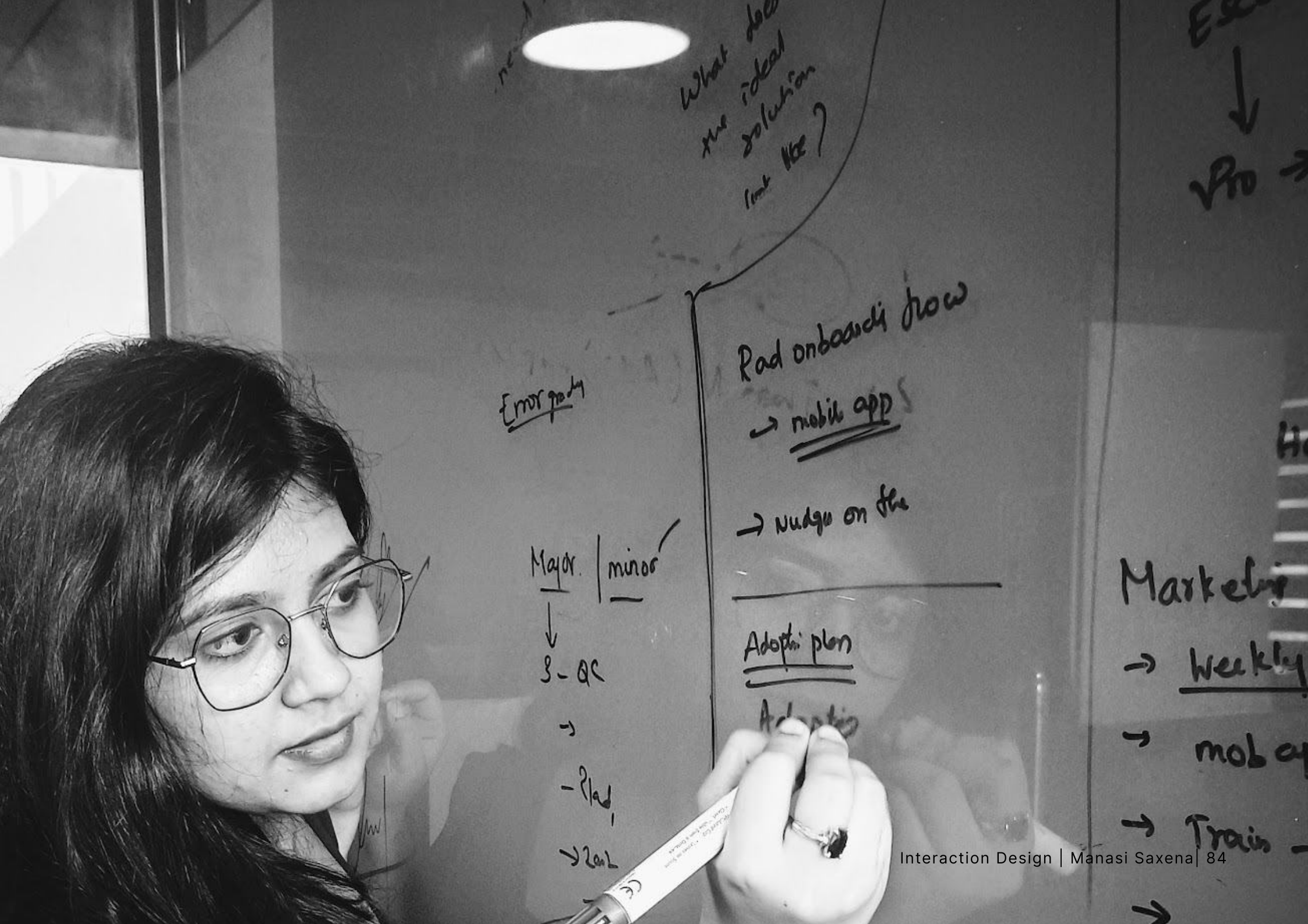
- Inadequate tools for real-time communication and seamless data sharing hinder multidisciplinary teamwork.

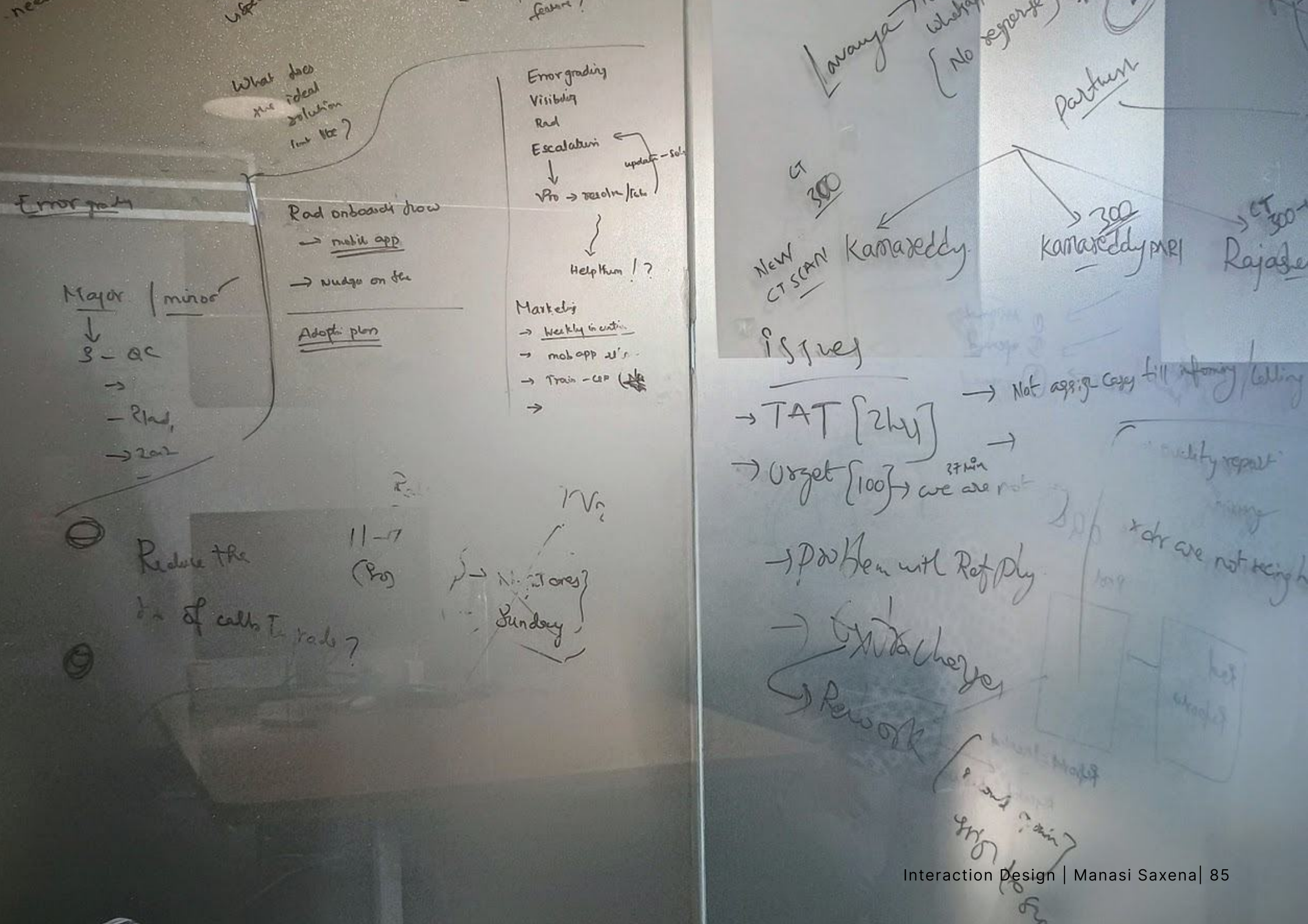


PROBLEM STATEMENT

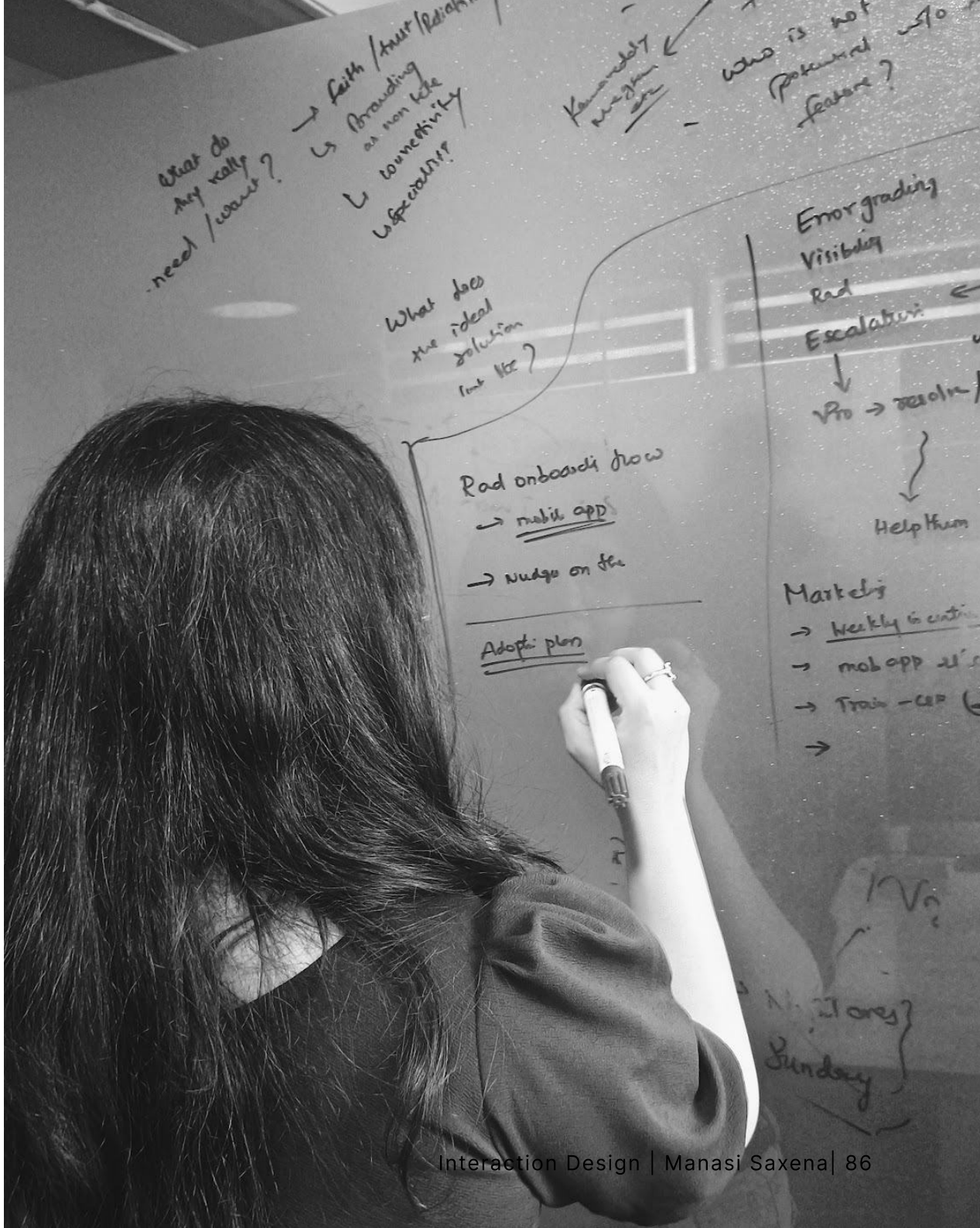
Ideations

A user flow is a chart or diagram showing the path a user will take in an application to complete a task.


What does the ideal solution look like?
Error proofing
Major | minor
Rad onboarding flow
→ mobile app
→ Nudges on the
Adoption plan
Marketing
→ weekly
→ mob
→ Train

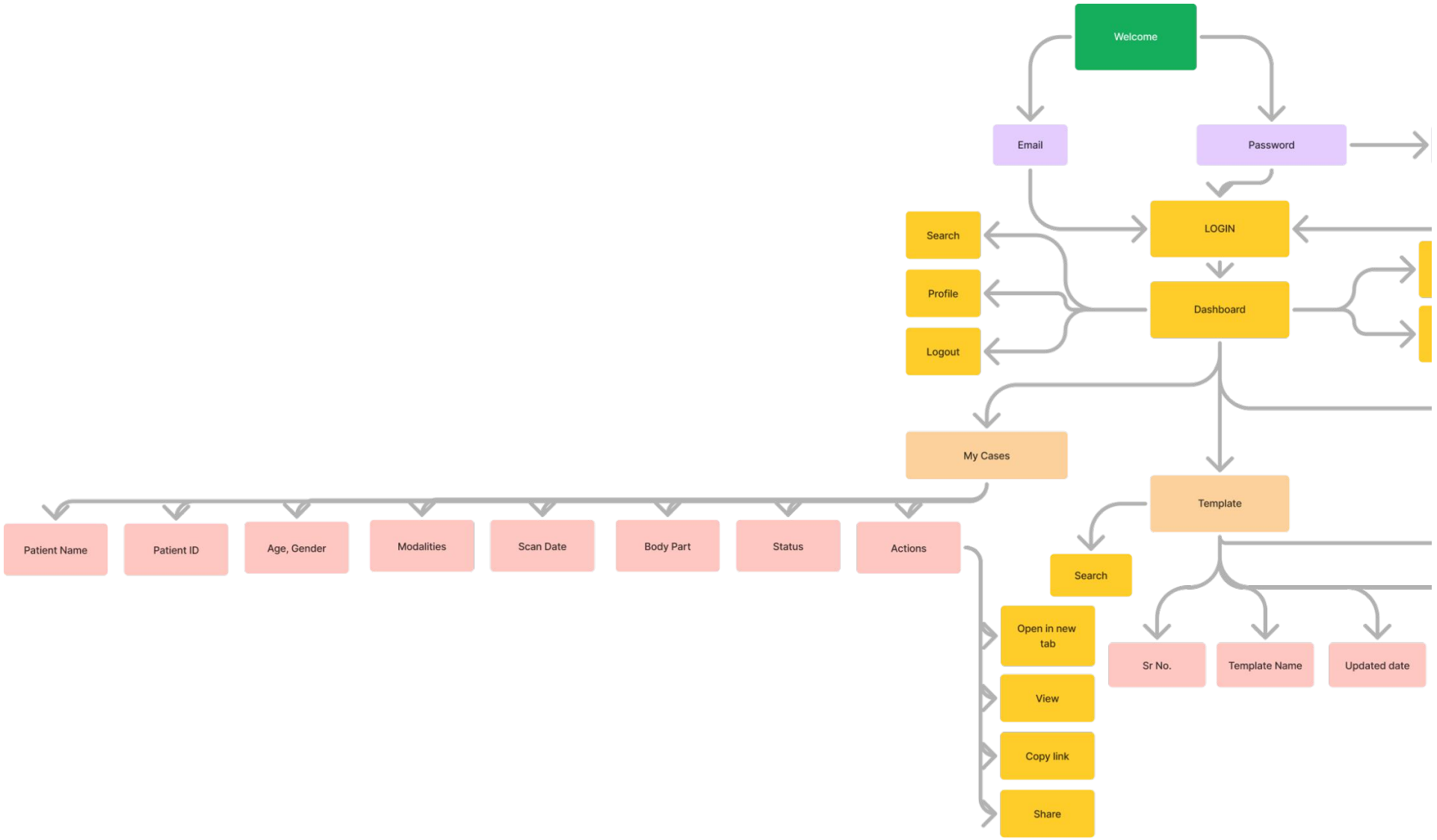

What does the ideal solution look like?
Error grading
Visibility
Rad
Escalation
Helpline!?
Rad onboarding flow
→ mobile app
→ Nudges on the
Adoption plan
Marketing
→ Weekly incentive
→ mob app ui's
→ Train - CEP
Major | minor
3 - QC
→
- Rad,
→ 2nd
Reduce the
Parturn
NEW CT SCAN
Kamareddy
Kamareddy MRI
Rajaje
ISSUES
→ TAT [2hr]
→ Not assign Case till morning/telling
→ Urgent [100] → we are
→ problem with Ref Dly
→ Charges
→ Rework
Sunday

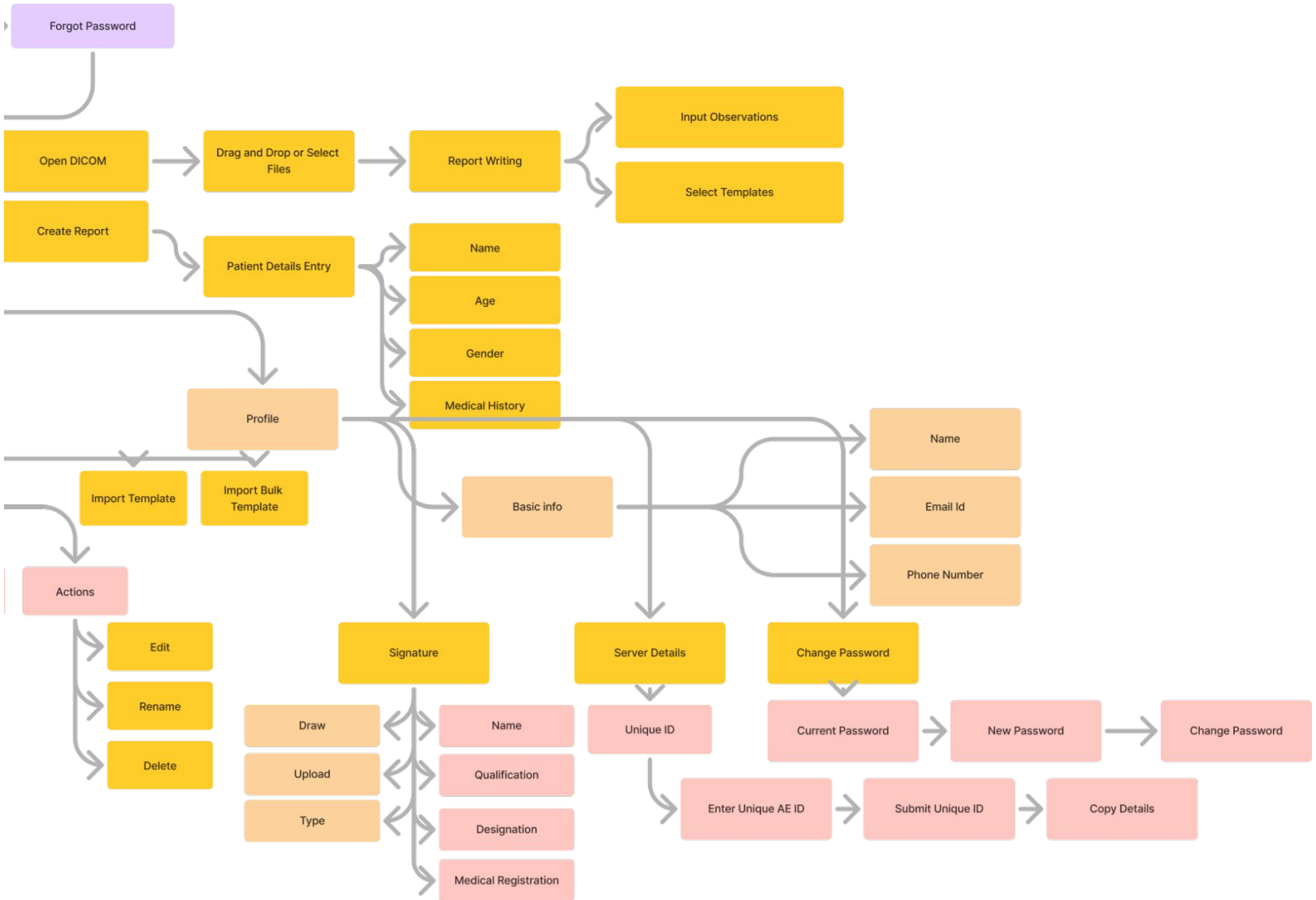
Brainstorming



User Flow


Splash
screen


Welcome
Email
Password
LOGIN
Search
Profile
Logout
Dashboard
My Cases
Template
Patient Name
Patient ID
Age, Gender
Modalities
Scan Date
Body Part
Status
Actions
Search
Open in new tab
View
Copy link
Share
Sr No.
Template Name
Updated date


Forgot Password
Open DICOM
Drag and Drop or Select Files
Report Writing
Input Observations
Select Templates
Create Report
Patient Details Entry
Name
Age
Gender
Medical History
Profile
Import Template
Import Bulk Template
Basic info
Name
Email Id
Phone Number
Actions
Edit
Rename
Delete
Signature
Server Details
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Enter Unique AE ID
Submit Unique ID
Copy Details

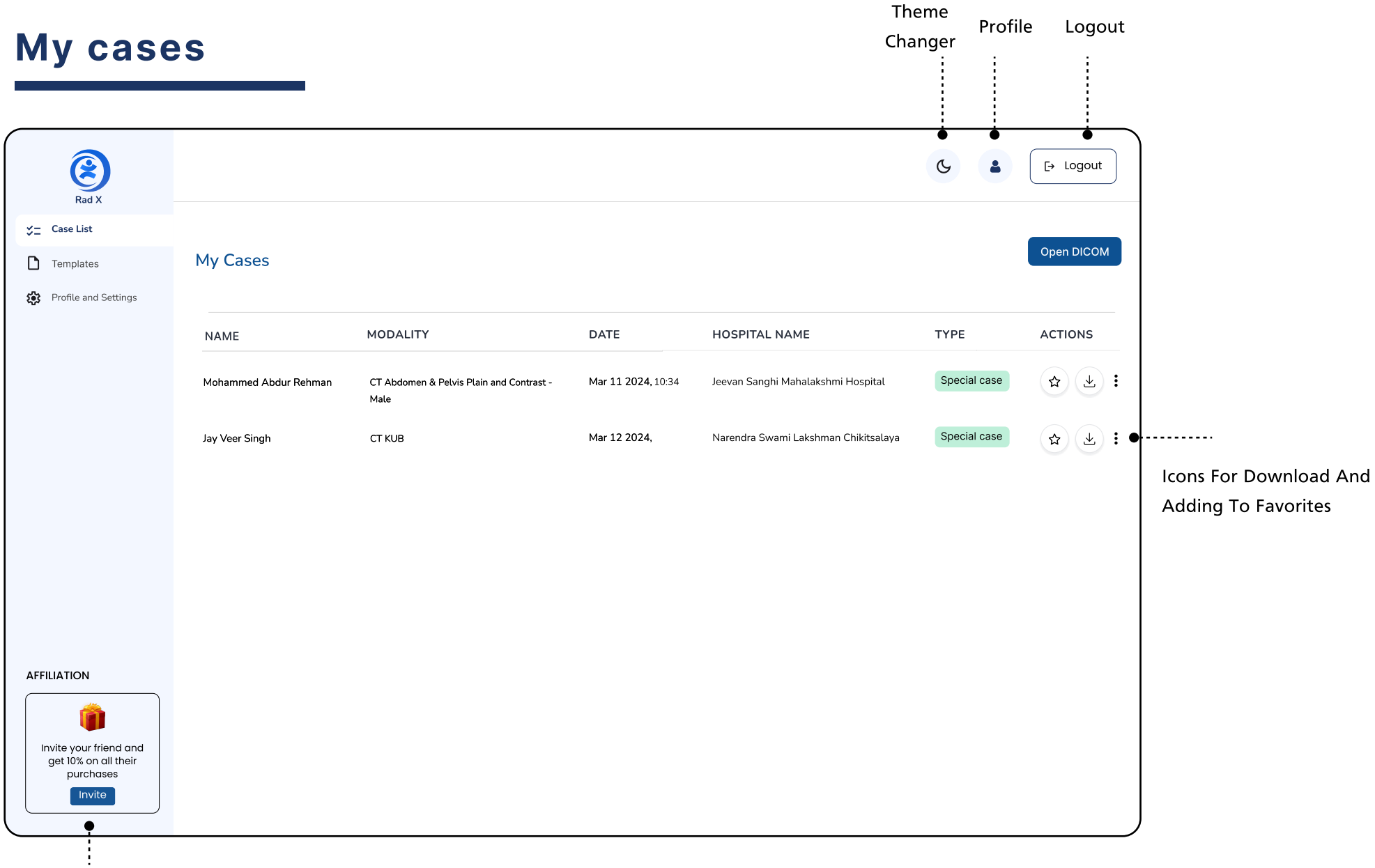
Final Prototype

Screens and explanation



Hi-Fidelity Screens

My cases

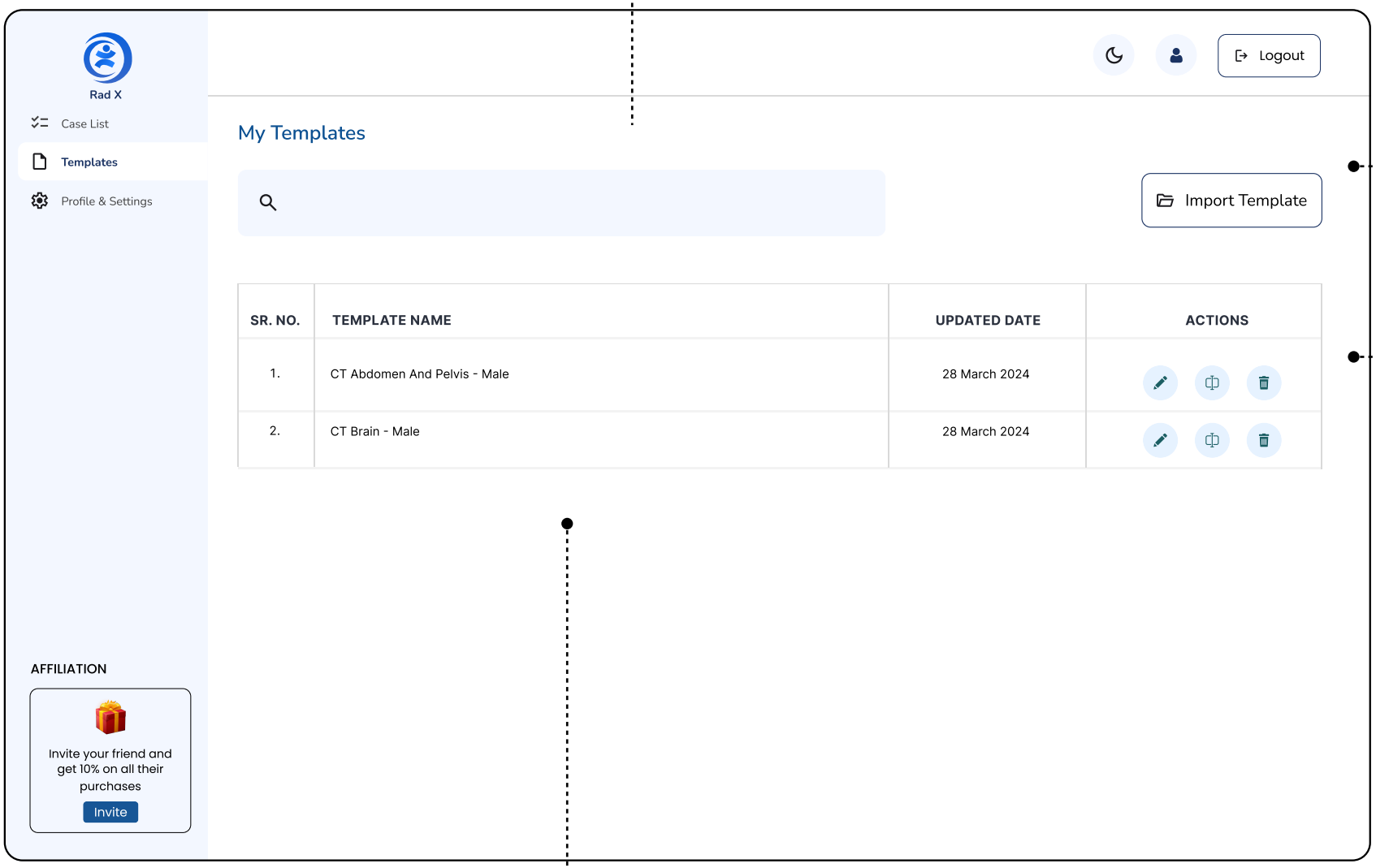


Icons For Download And Adding To Favorites

An Invitation To Refer Friends For A 10% Discount On Purchases, Enhancing User Engagement And Growth Through Referrals.

Template

To Search Through Templates



Upload Any Template To Edit And Report

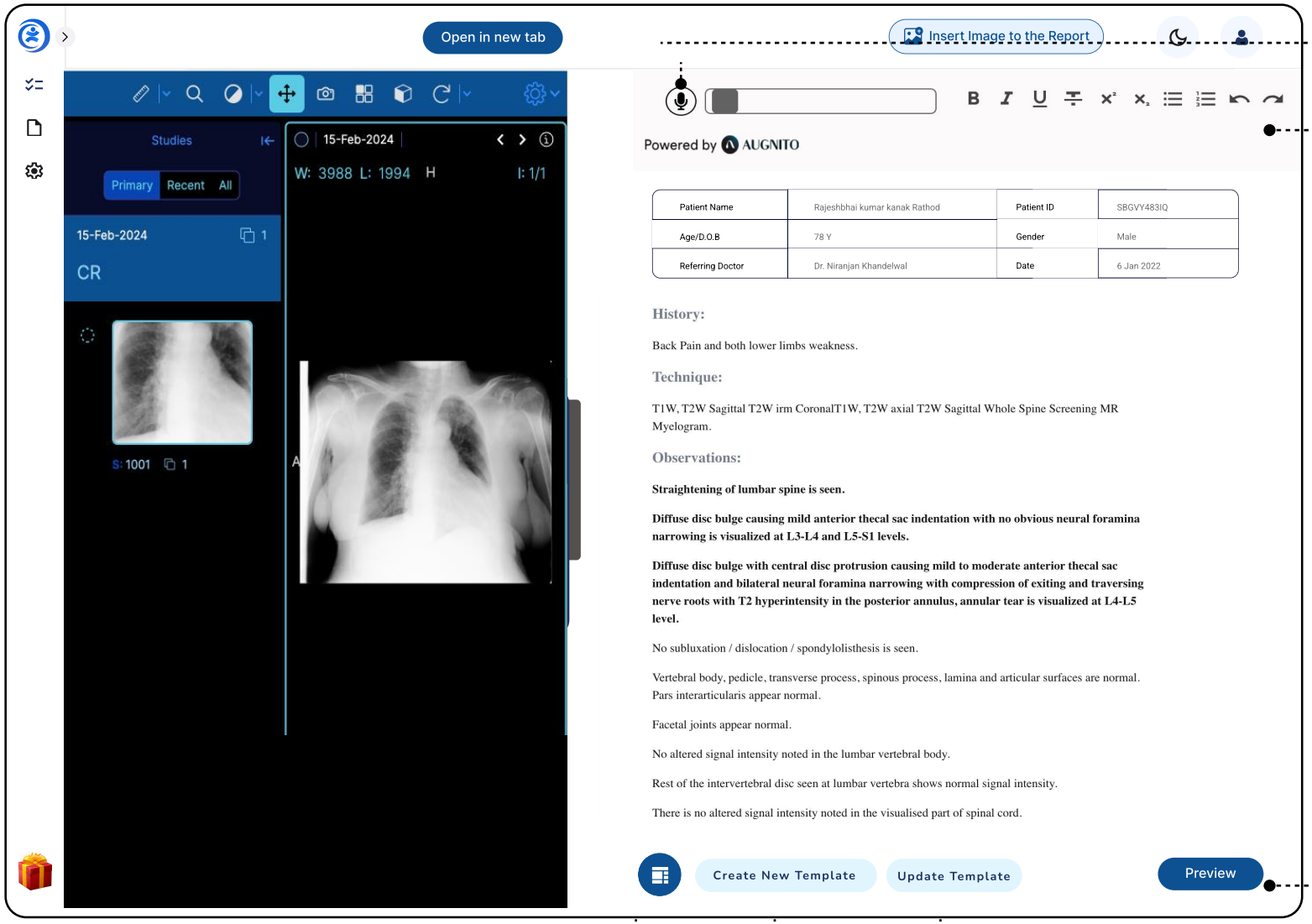
Icons To Edit, Copy, And Delete Templates.

Lists Templates By Serial Number, Template Name, And Updated Date.

Reporting

If doctor wants to see it full screen in a new tab they can opt this icon

The Images will be copied by clicking on this icon and teh doctor can paste it in the report



Speak and automatically this AI will write your report

Formatting options

Preview the report before sending

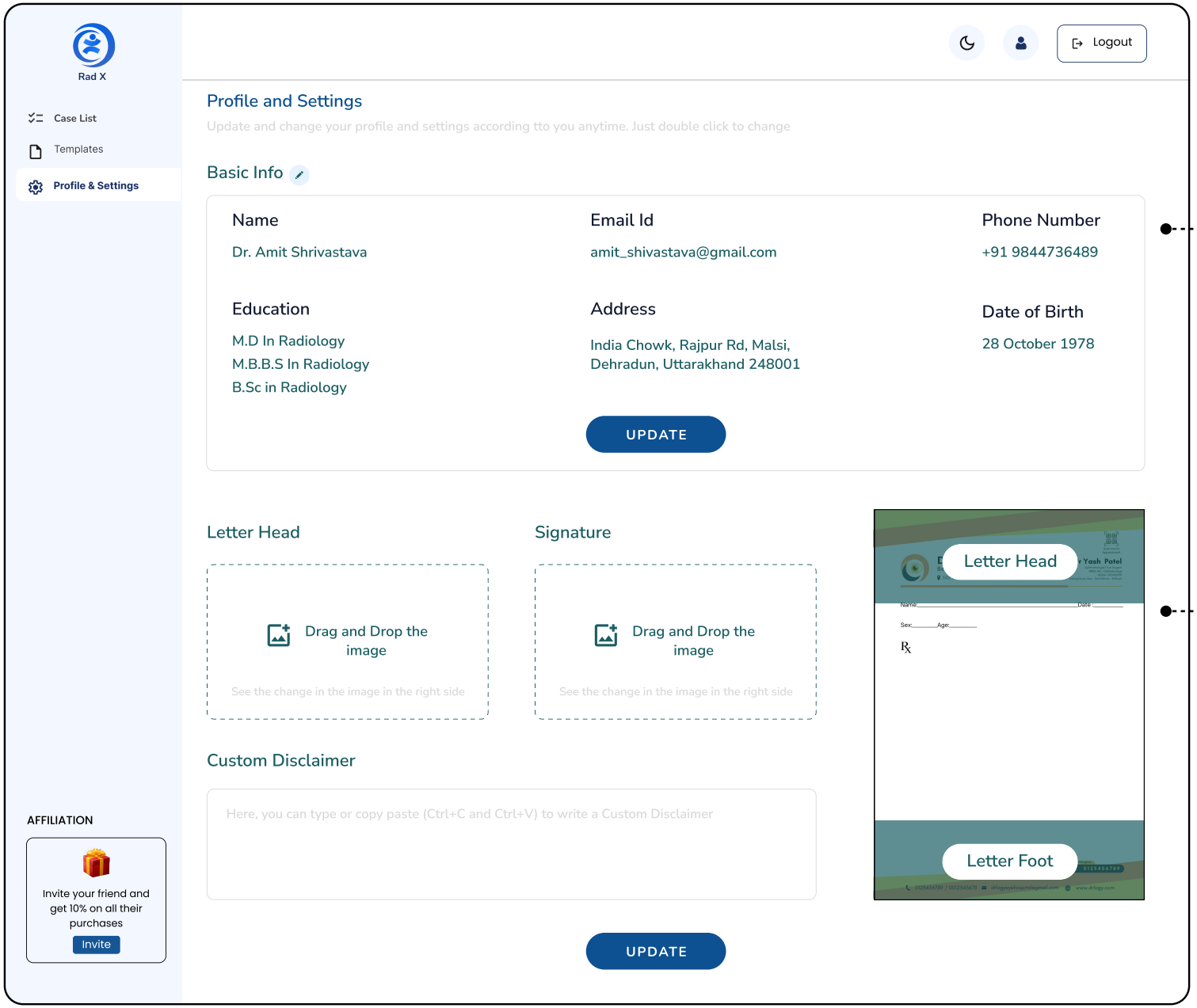
Choose templates from the icon

Can start new reporting by clicking this

If making any changes and finalize this template, they can use it further by adding this template

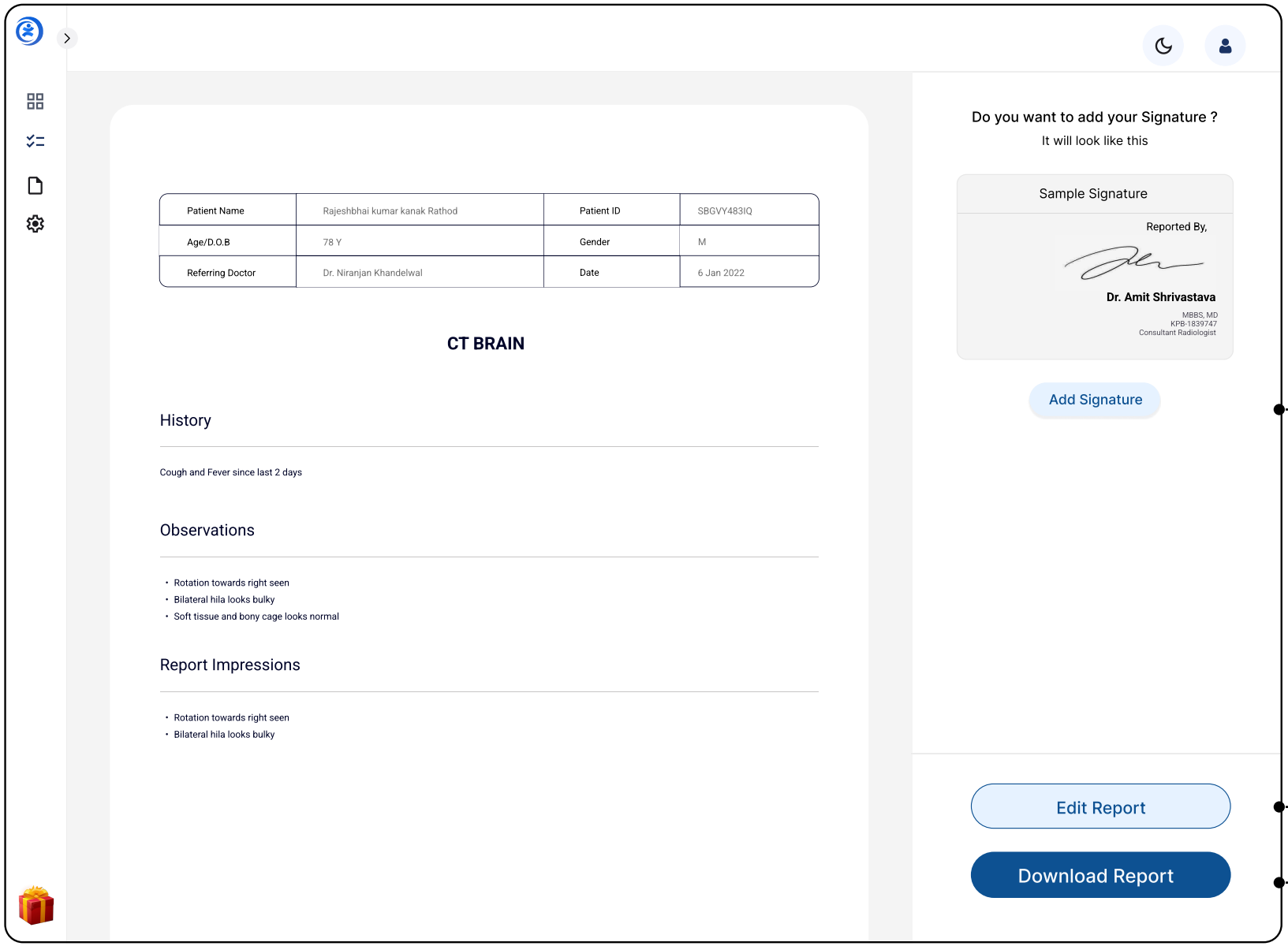
Profile

This page is scrollable



Editable Fields For User's Basic Information.

Shows How The Signature And Letter Head Will Appear On Reports.

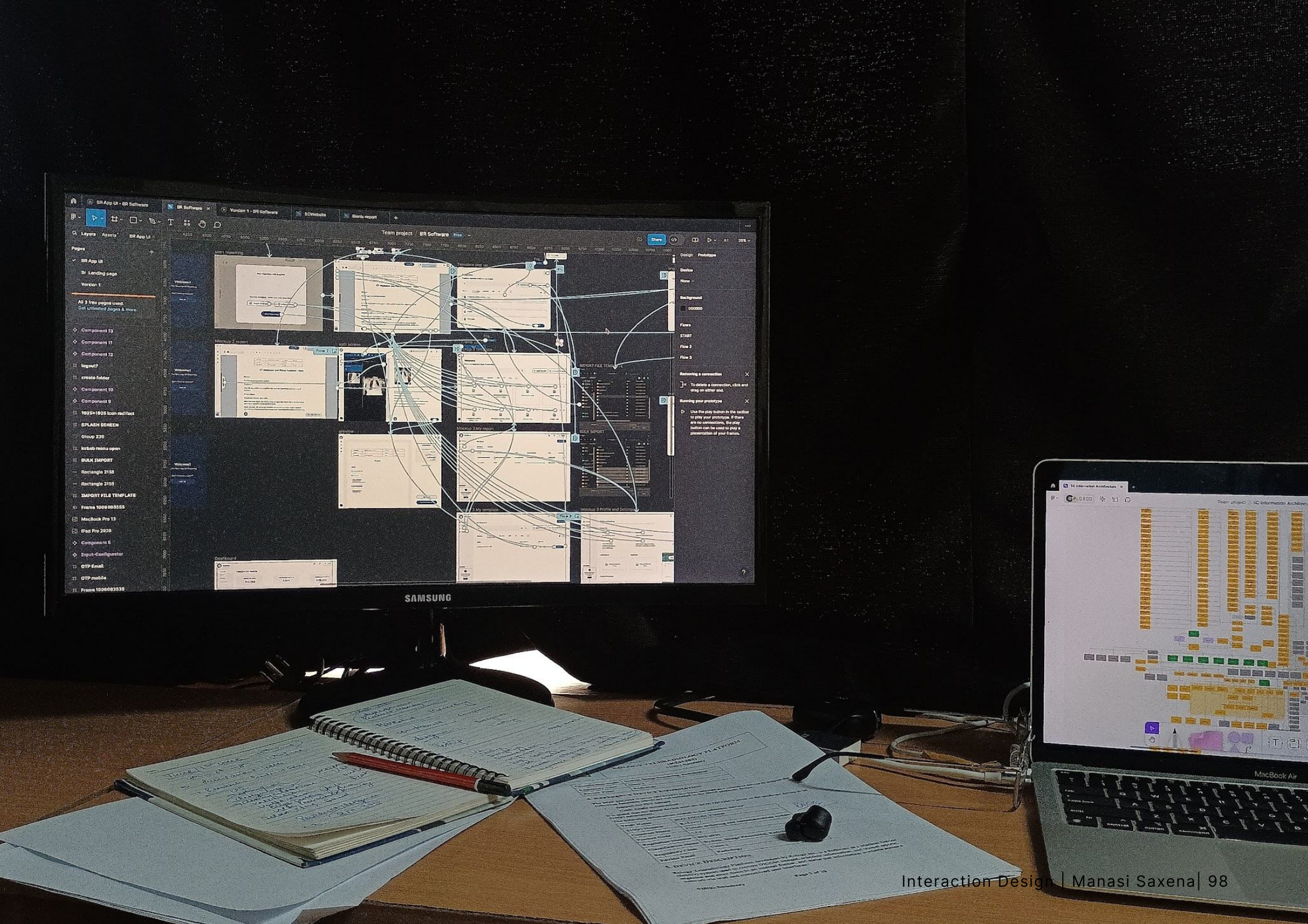


Doctor can add signature at the end of the report

Edit the report

Download the report

This is how the Preview will be seen


SAMSUNG
MacBook Air

Prototype


SAMSUNG