DISSERTATION REPORT

ON

STUDY OF EXISTING PROCESS AND PROJECTS PERTINENT TO

ONGOING

PROJECTS IN PHILIPS HEALTHCARE

UNDER

PHILIPS ELECTRONIC INDIA LIMITED (PEIL)

At Gurgaon

International Institute of Health Management Research

New Delhi -110075

June - 2013

PHILIPS

FEEDBACK FORM

Name of the Student: Seema Mumtaz

Dissertation Organization: Philips electronic India limited (PEIL), (healthcare)

Area of Dissertation: Healthcare informatics

Attendance: Regular

Objectives achieved:

- Have worked in forming the frame work on data management policies pertinent to health care informatics.
- Working on a health care project based on policy and regulatory for health care informatics.

Deliverables:

- Delivered documents in the form of Microsoft excel and Microsoft word required for the ongoing project in healthcare informatics.

Strengths:

- Demonstrates thorough knowledge to fulfill key responsibilities as per the requirements of the project.
- Take initiatives in understanding the processes and gathering insights required for the assigned project development.
- Adaptable in adding input of other stake holders involved in the assigned project.

Suggestions for Improvement:

- Have to develop more conceptual understanding in the area of healthcare informatics.

Signature of the Officer-in-Charge/

Organization Mentor (Dissertation)

Varun Belgudri
Business analyst
9910 101650

Date: 1/05/2013

Place: New Delhi, (Gurgaon)

PHILIPS

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Philips People Services

May 30, 2013

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Ms. Seema Mumtaz, has done his/her Dissertation training program for three months from 18th February 2013 to 17th May 2013 in Philips Electronics India Limited (PEIL), Gurgaon. She worked on the project based on Clinical Informatics in healthcare. We have found her sincere & hard working during this tenure.

We wish her all the best for the future endeavors.

For Philips Electronics India Limited

Shilpa Rawat

Senior Manager – Human Resources

CERTIFICATE OF APPROVAL

The following dissertation titled "**Improved continuum of care with evidence based clinical intervention in Philips health care "in PHILIPS ELECTRONIC INDIA LIMITED (PEIL) in healthcare domain** is hereby approved as a certified study in management carried out and presented in a manner satisfactory to warrant its acceptance as a prerequisite for the award of **Post- Graduate Diploma in Health and Hospital Management** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

Dissertation Examination Committee for evaluation of dissertation

Name	Signature
Dr. R. BHALLA	01 June 2013
Dr. VINAY TRIPATHI	1st June 2013
Dr Pretha GS	1 June 2013
.....	.....

CERTIFICATE FROM DISSERTATION ADVISORY COMMITTEE

This is to certify that **Ms. Seema Mumtaz,** a graduate student of the **Post- Graduate Diploma in Health and Hospital Management**, has worked under our guidance and supervision. He/ She is submitting this dissertation titled "**study of existing process and projects pertinent to ongoing projects in Philips Electronic India Limited (PEIL),** in partial fulfilment of the requirements for the award of the **Post- Graduate Diploma in Health and Hospital Management**.

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report or book.

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I would like to thank Dr.Bhalla (Dean academics), Anandhi Ramchandran(faculty) and Indrajeet Bhatacharya (faculty) for guiding me in my project and helping me in completing the dissertation successfully.

I would like to pay special thanks to Sreeji Gopinathan (Director IT) for giving me this wonderful opportunity to complete my dissertation in Philips Electronic India Limited (PEIL)

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ORGANISATION'S PROFILE

The foundations of Philips were laid in 1891 when Anton and Gerard Philips established Philips & Co. in Eindhoven, the Netherlands. The company begun manufacturing carbon-filament lamps and by the turn of the century, had become one of the largest producers in Europe. By 1910, with 2,000 employees, Philips was the largest single employer in The Netherlands.

Stimulated by the industrial revolution in Europe, Philips' first research laboratory was established in 1914 and the company started introducing its first innovations in the x-ray and radio technology. Over the years, the list of inventions has only been growing to include many breakthroughs that have continued to enrich people's everyday lives.

1915 – 1925 Innovation and Diversification: X-rays and Radio Reception

In 1918, Philips introduced a medical X-ray tube. This marked the beginning of the diversification of the company's product range and the moment when it began to protect its innovations with patents in areas stretching from X-ray radiation to radio reception.

Wherever we encounter it, the Philips brand is a familiar sight in millions of households and buildings throughout the world with its instantly recognizable word mark of seven blue capitalized letters. Although the company has evolved and grown over more than hundred years, Philips' visual brand identity is rooted in its early years at the beginning of the 20th century.

Advertising Philips Brand Today:

Whilst the logo of the company has been consistent since the1930s the way in which Philips has advertised and communicated to the outside world has varied. In general, until the mid-1990s all advertising and marketing campaigns were carried out at product level on a local market basis. This led to many different campaigns running simultaneously, not giving a global representation of Philips as a global company.

To establish consistent global presence, in 1995 Philips introduced the first global campaign in 1995 under the tagline "Let's make things better". This theme encapsulated the "One Philips" thinking and was rolled out globally in all markets and on all Philips products. This was also the

first campaign that bought the whole company together, giving the employees a sense of belonging and providing a unified company look for an external audience.

In September 2004, Philips launched its “sense and simplicity” brand promise, which marked a new way forward for the company. “Sense and simplicity” reflects Philips’ commitment to be a market-driven company that provides products and services that fulfill the promise of being “designed around you, easy to experience and advanced”.

In 2008, the total estimated value of Philips brand increased by 8% to USD 8.3 billion and was ranked the 43rd most valuable brand in Interbrand’s 2008 ranking of best global brands.

OBJECTIVE:

Royal Philips Electronics of the Netherlands is a diversified Health and Well-being company, focused on improving people’s lives through timely innovations. As a world leader in healthcare, lifestyle and lighting, Philips integrates technologies and design into people-centric solutions, based on fundamental customer insights and the brand promise of “sense and simplicity”

Improving people’s lives through meaningful innovation:

For the past 120 years our meaningful innovations have improved the quality of life for millions, creating a strong and trusted Philips brand with market access all over the world. In light of key global trends and challenges – e.g. the demand for affordable healthcare, the energy efficiency imperative, and people’s desire for personal well-being – we are confident in our chosen strategic direction.

Mission:

 Improving people’s lives through meaningful innovation.

Vision:

 At Philips, we strive to make the world healthier and more sustainable through innovation. Our goal is to improve the lives of 3 billion people a year by 2025. We will be the best place to work for people who share our passion. Together we will deliver superior value for our customers and shareholders.

About Philips and health & well-being:

Philips is a diversified health and well-being company, with a mission to improve people's lives through meaningful innovations. As a world leader in healthcare, lifestyle and lighting, Philips integrates technologies and design into people-centric solutions, based on fundamental customer insights and the brand promise of "sense and simplicity".

INTRODUCTION ABOUT PHILIPS HEALTHCARE

Philips Healthcare is committed to providing meaningful innovations that improve the quality of care, enhance patients' lives and enable the delivery of better outcomes at lower cost. As a global leader in health care, Philips harness the power of clinical information by providing clinicians and health care providers with real time information all in one place, across modalities, time zones and technologies for more confident decision making and efficient work flow.

Philips is a world leader in cardiology, and with a strong presence in cardio-pulmonary, oncology and women's health, we are well positioned to help clinicians diagnose, treat and manage today's most prevalent diseases such as congestive heart failure, breast and other cancers, respiratory and other coronary artery diseases as quickly, effectively and efficiently as possible. Our focus is on understanding the complete cycle of care – from disease prevention to screening and diagnosis through to treatment, monitoring and health management – and choosing to participate in the areas where we can add significant value.

We believe clinical excellence and continuous innovation around the patient experience can fundamentally change healthcare as we know it. Our competitive advantage lies from clinical perspective, the broad clinical subject-matter expertise within the company, as well as the deep clinical relationships we have with our customer base.

Philips health care business constitutes four strategic business groups namely

- Imaging system (IM): Integrated imaging solutions that include radiation oncology, clinical applications and platform and portfolio management. Advanced diagnostic imaging included computed tomography (CT), magnetic resonance imaging (MRI),molecular imaging(MI) and diagnostic X-ray including digital X-ray and mammography, interventional x-ray encompassing cardiology radiology surgery and other areas and ultrasound, a modality with diverse consumers and board clinical presence.

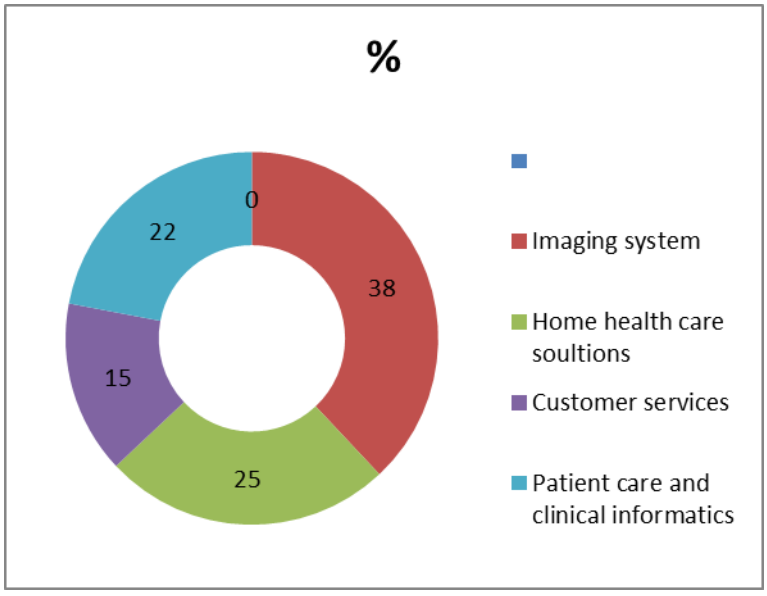
- Patient care and clinical informatics (PCCI): Enterprise patient monitoring solutions, from value solutions to sophisticated connected solutions, for real time clinical solutions at patient's bed side; cardiology informatics and enterprise imaging informatics including picture archiving and communication system and other clinical information management system; patient

monitoring and clinical informatics; mother and child care including products and solutions for pregnancy, labor and delivery.

New born and Neonatal intensive care; transition home and therapeutic care including cardiac resuscitation, emergency care solutions and therapeutic temperature management and anesthesia care, hospital respiratory system and ventilation.

Home health care solutions (HH): sleep management, respiratory care and non-invasive ventilation and medical alert and medication dispensing services for independent living and remote patient monitoring.

Customer services (CS): equipment services and support including service contracts, equipment maintenance, proactive monitoring and multivendor services and managed service program including equipment planning and asset management.



Total business sales by 2012 constitutes thirty eight (38%), twenty five(25%),fifteen(15%), Twenty Two (22%) in imaging system, home health care solutions, customer services and patient care and critical informatics respectively.

PROJECT	NAME OF THE PROJECT
Project Title	To study the existing process and projects related to ongoing projects in Philips healthcare.
Subtitle -1	To study the tracking of demo assets by using a data base application.
Subtitle-2	To study the MRI application support log process in order to enhance the service delivery.
Subtitle- 3	To study about the e- ICU program of Philips healthcare.
Subtitle- 4	To develop a framework on data management policies for clinical informatics products.

GLOSSARY

- Demo assets:

The modalities that are used for the demonstration purpose by the customer before buying the same model.

- Logistics and supply chain management:

Logistics is the management of the flow of resources between the point of origin and the point of consumption in order to meet some requirements, for example, of customers or corporations.

Supply chain management (SCM) is the management of an interconnected or interlinked between network, channel and node businesses involved in the provision of product and service packages required by the end customers in a supply chain.

- Stock transport notes (STN):

Stock delivery note (STN) is a form of receipt, issued by the suppliers, which accompanies a delivery of goods, specifying their type and quantity.

- Return Delivery Note (RDN):

It is made in reference to delivery note (DN) after the demo assets are being transported to customers.

- MRI:

Magnetic resonance imaging

- RF coil:

Radio frequency coil

- FSE:

Field service engineer

- Polaris:

It is software used in the service delivery process for feeding the information about the calls and services that are being offered as per the calls received.

- Tesla:

The tesla (symbol T) is the SI derived unit of magnetic-field strength or magnetic-flux density, commonly denoted as T, (which is also known as "magnetic field"). One tesla is equal to one weber per square meter [1].

- Utilization rate:

It is particularly measured when the demonstration modality is transferred from the organization or the ware house to the customer and for how much it is utilized by the customer.

- e-ICU

Electronic Intensive care unit

- HIPPA

Health insurance portability and accountability act

INTRODUCTION

The study about the ongoing projects in Philips healthcare constitutes projects being implemented at various levels.

Philips healthcare is a mammoth organization and there are many upcoming projects in order to develop business areas. Hence, the study elucidates about the various projects that have been assigned.

The various subtitles of the project include:

- To study the tracking of demo assets by using a data base application:

It explains about the data base application that has been introduced in order to track the demo assets being used by customers.

- To study the MRI application support log process in order to enhance the service delivery:

It explains about the Remote support log process used to provide MRI services and further elucidate about processes that have been implemented in order to enhance the service delivery.

- To study about the e-ICU program of Philips healthcare:

It explains about the upcoming e-ICU program of Program introduced by Philips healthcare.

- To study about the frame work formed for enhancing the data management policies of Philips healthcare:

It shows the various data management that needs to be incorporated for enhancing the data management in Philips healthcare products.

OBJECTIVES

GENERAL OBJECTIVE:

To study the existing process and projects related to ongoing projects in Philips healthcare.

SPECIFIC OBJECTIVES:

- To study the tracking of demo assets by using a data base application for the modalities being transported for demonstration.
- To study the MRI application support log process in order to enhance the service delivery.
- To study about the e-ICU program of Philips healthcare.
- To develop a framework on data management policies for clinical informatics products.

STUDY METHODLOGY

The study about the ongoing process and projects about Philips healthcare is based on the secondary study.

Study design: Secondary study from various sources of information and observational study within the organization.

Study area: Philips Electronic India Limited (PEIL)

SUB TITLE-1: DEMO ASSET TRACKING APPLICATION DATA BASE IN LOGISTICS AND SUPPLY CHAIN MANAGEMENT:

What is logistics and supply chain management?

Supply chain management (SCM) is the management of an interconnected or interlinked between network, channel and node businesses involved in the provision of product and service packages required by the end customers in a supply chain[2]

SCM draws heavily from the areas of operations management, logistics, procurement, information technology and strives for an integrated approach [3].

Logistics:

Logistics is the management of the flow of resources between the point of origin and the point of consumption in order to meet some requirements, for example, of customers or corporations[4].

The logistics of physical items usually involves the integration of information flow, material handling, production, packaging, inventory, transportation, warehousing, and often security [5].

The complexity of logistics can be modeled, analyzed, visualized, and optimized by dedicated simulation software [6].

Demo tracking application has been adopted in logistics and supply chain management, in order to track the various demo assets that are being used by the customer all across the country. Hence, it is a part of logistics and supply chain management.

Share point data base introduced by Microsoft has been used, where all the data regarding the procurement of the material management. The system is designed according to its own set of usage in terms of material management. It mainly constitutes

Stock transport notes (STN):

Stock delivery note (STN) is a form of receipt, issued by the suppliers, which accompanies a delivery of goods, specifying their type and quantity.

It keeps a track on demo assets being transported from Philips office.

Delivery note:

It keeps a track on when the demo assets are being transported to customers.

Return Delivery Note (RDN):

It is made in reference to delivery note (DN) after the demo assets are being transported to customers.

Why this application data base has started?

Philips healthcare is a mammoth domain and the supply of the assets constitutes all kind of modalities of healthcare and tracking of all the assets is a tedious task.

Additionally, tracking of these assets being used for demonstration becomes an important part of the procedure because of the following reasons

- Approximately, thirty crores of the budget is utilized in demo materials (all the assets being transported to the customer).Hence forth, it becomes an important part to keep track of all the demo assets that are being transported.

- The transfer of demo assets usually takes place from Philips office or ware house to customer, but as a convenient option it gets transferred from one customer to another without any record.

- Even after the transportation of Demo asset from one customer to another, the data base is maintained in compliance with movement of demo asset from one customer to another to keep the track.

Normal procedure of delivery:

Philips electronics order → Demo asset (local plant or ware house) deliver → to the customer

→ Return back Philips office or ware house.

But, what happens?

Philips electronics order → Demo asset (local plant or ware house) deliver → to the customer

Transfer to another customer.

- Utilization rate is being calculated for the demonstration of utility of demo asset.

STN format constitutes

Transfer Date

From Location

To Location

Material unit

All the options pertinent to data already exist and they are aligned to specific codes in numbers, clicking the options do reflect the specific numbers and the data is filled.

DN format constitutes

DN

From Location

To Location

- Conform the PNDT certificate copy
- Demo asset request letter

Clicking the tick mark on both options will help in carrying the task further.

- ✓ Prenatal diagnostic techniques act and rules has been incorporated in the data base, since it is an important requirement to adhere to policy and regulatory established by government of India.

RDN constitutes:

Transfer Date

Reference -DN

The options for “from location” and “to location” automatically pop up.

Limitation of the data base application:

The data base application is not flexible to enter the entries umpteen times depending on the requirement. Once it is entered there is no other alternative way to modify it as per the requirement.

SUBTITLE 2: TO STUDY THE MRI APPLICATION SUPPORT LOG PROCESS IN ORDER TO ENHANCE THE SERVICE DELIVERY.

What is MRI?

MRI is an acronym for Magnetic Resonance Imaging. It is a procedure used in hospitals to scan patients and determine the severity of certain injuries. An MRI machine uses a magnetic field and radio waves to create detailed images of the body [7].

How does MRI work?

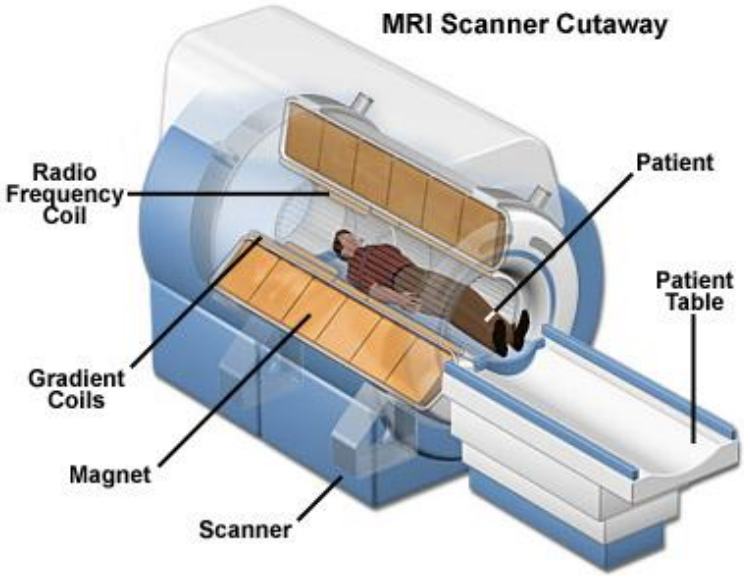
A strong magnetic field is created by passing an electric current through the wire loops. In the meanwhile, other coils in the magnet send and receive radio waves. This triggers protons in the body to align in the direction of radio waves. Once aligned, radio waves are absorbed by the protons, which stimulate spinning. Energy is released after "exciting" the molecules, which in turn emits energy signals that are picked up by the coil [8].

This information is then sent to a computer which processes all the signals and generates it into an image. The final product is a 3-D image representation of the area being examined [9].

Why to undergo for MRI Procedure?

MRIs can provide very early detection of many conditions, so treatment can be more effective. The excellent quality of MRI images can also provide the best possible information if surgery is required. If there is an abnormality, MRI can show exactly where it is, its size, and whether or not it has spread [10]

DIFFERENT PARTS OF MAGNETIC RESONANCE IMAGING (MRI):



Different parts of MRI:

It mainly constitutes patient table, MRI scanner, gradient coil, magnet and radiofrequency coil (RF).

MRI scanner is large and cylindrical in shape. MRI Machine is just like a tube which is surrounded by a magnet. This magnet is very useful in creating strong magnetic fields .There is a movable bed which can be placed at the side of the magnet. MRI scanning is placed on the bed which is inserted in to the magnet. Then depending on the problem the area which requires MRI scanning, the coil is slide on the patient [11].

The magnetic coil is the main part of the machine as it receives the actual MR signal which is then further processed. The soft tissues that are present in the body contain water molecules on which magnet can be reached. This magnet will act on protons present in the body .The protons that are present in the soft tissue when acted by magnet produces some kind of response in return [12.]

The strong magnetic field is created as the electricity is passed through the wire loops of the machine. The different protons produce the signal aligning to the radio waves which are then processed by the computer. This computer process entire the response coming through radio waves .The scanner for handles all the responsive signals and then passing them to computer to generate the image [13].

The hydrogen atoms present in the water composition of the body .The MRI scan mainly uses these hydrogen atoms in order to get the picture of the tissue [14].

The magnetic field that is been created by passing of electricity should have uniform density and strength [15].

DIFFERENT TYPES OF MRI MACHINES OFFER BY PHILIPS HEALTHCARE:

Philips is a leading innovator in the field of MRI, having introduced the first 1.5T and 3.0T compact magnet, SENSE parallel imaging and MultiTransmit for 3.0T. The MRI systems help to increase efficiency and obtain excellent clinical results for diagnostics and therapy. Philips healthcare is continuing to stretch the envelope with systems such as the Ingenia with dStream architecture.

Philips Ingenia 3.0T:

It elevates clinical performance, accelerate patient management and improve economic value.

Philips dStream digital broadband MR architecture

The MRI system is constantly evolving towards higher levels of performance in terms of better image quality and consistency, faster imaging and processing, and higher patient throughput. To fundamentally and simultaneously address all these needs, Philips has introduced the revolutionary dStream architecture [16].

MultiTransmit:

MultiTransmit technology overcomes dielectric shading by using simultaneous (parallel) transmissions from multiple RF sources. It automatically optimizes the power, amplitude, phase, and waveform for optimal RF uniformity[17].

Achieva 3.0T X-series MRI:

Achieva 3.0T X-series MRI combines simple operation with fast scanning and superb image quality. It offers an extremely broad clinical reach from routine head, spine and musculoskeletal imaging to the most advanced exams[18].

- Magnet characteristics
- Patient-friendly flared-bore magnet
- Shortest tunnel length in the industry
- Full-size 50 cm field-of-view

- Lightweight magnet - even available in a mobile version

Advanced integrated RF body coil for excellent body imaging and ultra-fast scanning

- High signal-to-noise
- Low SAR (Specific Absorption Rate)
- Minimal dielectric effects
- High RF uniformity

Panorama HFO:

It is an open wide MRI system. It entails high field clinical performance, preferred by patients, delivering unique value to the healthcare providers[19]

Specifications:

- Magnet weight 7000 kg
- Patient aperture 160 cm
- Maximum FOV 45 cm
- Typical homogeneity at 45 x 45 x 45 cm 2.8 ppm
- Typical homogeneity at 40 x 40 x 40 cm 1.0 ppm
- Helium Save technology (Zero boil-off)

Uterine fibroid ablation therapy:

Philips Sonalleve MR-HIFU for uterine fibroids:

Philips Sonalleve MR-HIFU is an exciting therapy platform that extends more options for women with painful fibroids or adenomyosis. It enables the physician to perform patient friendly, non-invasive ablation of these benign growths in the uterus.

MR-HIFU therapy platform:

It combines the advantages of a High Intensity Focused Ultrasound (HIFU) system with the superb imaging of Philips MR systems, MR-HIFU is much faster and more comfortable than surgical treatments to reduce patient stress and speed recovery [20].

The HIFU system and coil elements are integrated in the Sonalleve table. Ultrasound waves are focused onto the target volume, ablating the lesion without affecting nearby tissue. The process is monitored with real-time temperature sensitive MRI.

Curve top table provide extra patient comfort:

The curved tabletop is designed to relax the patient's shoulders for extra comfort. The large ultrasound window can reach a large treatment area.

Sonalleve table:

The dedicated Sonalleve table easily slides over the lowered MR table so that there should not be any restriction of moving patients or removing MR table. This can facilitate an easy Switch between diagnostic MR and HIFU therapy

D Stream:

The dStream digital connection and system cables are plugged in on the side of the table and coil cables on the top of the table. A storage cart organizes all supplies and cables.

Integrated coils:

It contains dedicated imaging coils designed for human pelvic and abdominal/body therapy applications are integrated in the Sonalleve table for optimum positioning and signal to noise ratio (SNR) [21].

Panorama HFO Oncology configurations:

Philips' Panorama HFO Oncology Configuration enables radiation oncologists to take full advantage of MRI's excellent soft-tissue contrast for delineating tumors and healthy anatomic structures. The system's spacious 160 cm wide patient aperture and dedicated software and hardware tools assure repeatable patient positioning from scan to treatment[22].

Key benefits facilitating Radiation Therapy

 Imaging in treatment position enabled by the system's open spacious design.

 Streamlined clinical workflow with MR images customized for Radiation Therapy planning.

 Provides accurate Radiation Therapy planning with geometric correction.

It provides fully validated workflow descriptions and dedicated Exam Cards for Radiation Treatment provides clinical MR images customized for Radiation Therapy planning. Exam Cards are available for brain, prostate, head & neck, female pelvis and other applications. They include a flat tabletop overlay with indexed edges, and a laser bridge for aligning patient position and for patient marking.

Quality assurance tools for evaluating image deformation and validating the alignment of the laser positioning system[22].

Achieva 7.0T MRI research system:

It is stable, optimized platform for advanced clinical research. Achieva whole-body-aperture 7.0T* MRI research scanner provides the ultra-high field strength essential for advanced clinical research in a stable, optimized platform.

It is adorned with Precision engineered and factory built system that works virtually out of the box. The cutting-edge imaging performance enables the physician to perform advanced studies within days.

7.0T MRI imaging and spectroscopy can provide valuable support in investigating arterial and neurodegenerative diseases such as Alzheimer's disease, multiple sclerosis, Parkinson's disease and epilepsy and enable these diseases to be detected much earlier than imaging at lower field strengths.

The extra detail revealed at 7.0T can also be particularly helpful for:

- Developing diagnostic procedures in the field of oncology
- Investigation of biological functions at cellular and molecular levels
- Better understanding of tumor biology and metabolic processes
- Enhanced lesion characterization

Benefit from a proven platform:

Achieva 7.0T MRI shares the proven technology platform of our 1.5T and 3.0T clinical systems for highly reproducible results to support your research needs. Its stability is further enhanced by Free Wave data-acquisition system with modular 32-channel architecture, providing the latest MRI functionality.

Achieva 7.0T MRI satisfies the research needs without compromising patient's comfort. The magnet façade can be integrated into the room design, reducing the perceived size of the 7.0T magnet. It has got spacious 58 cm aperture, providing a comfortable space to the patient during lying [23].

Elite Clinical Solutions:

Elite Clinical Solutions form an essential part of commitment to working closely with healthcare professionals to provide diagnostic and clinical support that matches day-to-day needs and working practices.

They are more useful in MRI functionality with the broad array of coils and performance enhancing options [24].

Elite Neuro Clinical Solutions:

It provides complete clinical solutions for better workflows and diagnostic confidence in neuro MRI. The Elite Neuro clinical solutions include advanced tools for brain and spine MRI.

It is derived from the best-in-class practices of MRI diagnostics in stroke, brain tumor, degenerative and autoimmune diseases. Elite Neuro clinical solutions combine new imaging techniques, accessories and workflow improvements to enhance clinical accuracy, diagnostic capabilities and speed of diagnostic MRI imaging. Therefore, it provides clinical solutions include advanced tools for brain and spine MRI.

It focuses on imaging techniques, accessories and workflows to enhance clinical accuracy, diagnostic capabilities and imaging speed [25]

Elite Neuro:

The MRI system is designed for increased ergonomics and efficiency through integrated workflows in BOLD fMRI and Exam Cards.

The imaging system is enhanced with consistent quality and reproducibility in images, thereby removing variations in imaging. By using anatomical landmarks in the patient, Smart Exam automatically plans scan geometries according to the preference of radiologist, taking account of patient's actual position in the scanner.

The result is highly reproducible providing good image quality, for any angulation, any patient, any operator, at any time, providing the necessary consistency in MR scanning for diagnostic confidence.

To improve the workflow in functional imaging, it has been provided with integrated stimulus-delivery systems to provide full integration of MRI and stimulus control via dedicated Exam Cards. The Exam Cards not only run the MRI scan, they also control Eloquence's paradigm generation and automatically start IView Bold for real-time fMRI analysis. This makes fMRI easy, reliable and fast.

Arterial Spin Labeling (ASL) allows assessment of brain perfusion without using contrast agents. By identifying the patient specific perfusion delay, multiphase ASL provides diagnostically relevant temporal information on the underlying vascular conditions.

Elite MSK (musculo skeletal) Clinical Solutions:

Elite MSK brings an exceptional clinical solution for musculoskeletal MR imaging to the physician. It combines dedicated tools to provide optimum workflow and consistency, a broad range of state-of-the-art MSK coils and advanced MSK imaging techniques, Elite MSK enables you to obtain comprehensive information from high-quality and reproducible images on all joints in an easy and reliable way.

The range includes:

- A flexible 8-channel small-extremity coil provides a perfect fit for the elbow and hand/wrist.
- Multi-purpose coils in different sizes, providing flexibility and the opportunity to deal with special cases with the accuracy required.

Improve workflow and consistency:

It creates reproducible, consistent clinical images, without need for operator intervention and independent of the exact position of the patient within the scanner. Other advanced imaging tools, such as SPAIR fat suppression, provide homogeneous image contrast over the entire imaging volume [26].

Elite Cardiac Clinical Solutions:

Elite Cardiac clinical solutions provide a powerful platform that enables you to easily integrate the latest cardiac MR imaging protocols into your daily clinical routines.

By combining state-of-the-art imaging techniques, dedicated accessories and streamlined workflow support tools, the Elite Cardiac clinical solutions enhance clinical accuracy, diagnostic capabilities and speed of diagnostic CMR (Cardiac MR) [27].

Fast analysis of cardiac conditions with Cardiac Specialist CX:

Cardiac Specialist CX provides the physician with a complete set of powerful CMR tools for fast analysis of ischemic heart disease. It includes optimized protocols for increased speed, optimized sequences for our 32-channel coil, and state-of-the art image processing and reporting.

It constitutes task-guided analysis guides you through every step of the analysis process, taking away guesswork. The automated segmentation and clinical reports on all relevant cardiac parameters can be generated in just a few minutes, with a minimum amount of user interaction [28].

Standardized Cardiac MR Protocols:

CMR is an appropriate test for a variety of ischemic and non-ischemic heart diseases, for which the Society for Cardiovascular Magnetic Resonance (SCMR) defined standardized cardiac MR scan protocols.

It provides an easy availability of all the protocols which can be downloaded thorough Philips MRI scanner via Net forum online community of Philips.

Elite Vascular Clinical Solutions:

It has an enhanced clinical accuracy and speed of diagnosis in vascular MRI .Elite Vascular Clinical Solutions provide the tools the physician needs for Vascular MR imaging, adapted for use in daily clinical routine work.

By combining state-of-the-art imaging techniques and streamlined workflow support tools, our Elite Vascular solutions help to enhance clinical accuracy, diagnostic capabilities and speed of diagnosis in vascular MR imaging.

Specifications:

- d Stream full digital technology for high SNR, Flex Stream for patient comfort, Smart
- Select for operator efficiency and d-SENSE for added speed
- Fast analysis of even the most challenging vascular pathologies with time-resolved MRA
- Non-contrast MRA methods
- Vessel Explorer for vessel measurements on-the-fly

Ingenia's dStream technology provides SNR up to 40%, thanks to digitization right at the surface coil elements, opens the way to increased temporal and spatial resolution.

Flex Stream brings patient comfort with table-integrated posterior coils and strapless anterior coils, as well as operator efficiency with increased table stroke for free choice of head-first or feet-first examinations and flexible dS-SENSE performance [28].

Elite Pediatric Clinical Solutions:

Elite Pediatric brings the physician the ultimate clinical solution for pediatric MR Imaging, adapted for use in daily clinical routine work.

By combining state-of-the-art imaging techniques, dedicated pediatric accessories and workflow support tools specifically developed for pediatric patients, Elite Pediatric helps enhance clinical accuracy, diagnostic capabilities and speed of diagnosis in pediatric MRI.

The Benefit from specialized pediatric Exam Cards giving the physician, direct access to the latest pediatric scan sequences, developed and tested by a global network of experts. It improves patient comfort and compliance with dedicated pediatric workflow peripherals, thereby enhancing clinical results.

Dedicated coils provide optimized pediatric image quality and workflow:

Dedicated pediatric coils and the digital RF technology of the Ingenia MR scanner gives physician up to 40% increase in SNR. The ergonomic design of dedicated pediatric coils and accessories provides exceptional patient comfort and simplify patient workflow.

An extensive set of pediatric workflow peripherals improves patient workflow and the Physiology sensors comes in a variety of sizes such as baby cradle, pediatric support cushions and mattresses provide improved patient handling and patient collaboration, further optimizing image quality [29].

Ambient Experience:

The 'kitten scanner' being used to familiarize young patients with the concept of an MR exam, is one element of our unique Ambient Experience solution.

With audiovisual themes interactively programmable to create the ultimate MR environment, Ambient Experience is not only a wonderful source of excitement for patients of all ages (and their doctors), but also may reduce patient anxiety and stress.

Elite Prostate Clinical Solutions:

When patients present with an elevated prostate-specific antigen (PSA) level, many can go onto multiple trans rectal- ultrasounds (TRUS)-guided biopsies with negative results. This leads to uncertainty for patients and to repeat biopsies.

MR Imaging complemented by MR-guided prostate biopsy can be an alternative for the appropriate patient population, augmenting other imaging tools such as ultrasound.

Philips Elite Prostate brings the ultimate clinical solution for prostate MR imaging for the physician. By combining state-of-the-art imaging techniques, a dedicated workstation for image analysis and streamlined MR biopsy guidance, Elite Prostate provides valuable support in the management of prostate disease.

Key advantages

- Dual-coil imaging and spectroscopy provide high spatial and temporal resolution and extensive coverage

- Dyna CAD for prostate provides both efficient image analysis and interventional planning SW

- Dyna TRIM (Trans-Rectal Interventional MRI) increases confidence of biopsy with MR-targeted biopsies[30].

MRI APPLICATION SUPPORT LOG PROCESS:

MR application support process is basically designed at three levels. A call initiates at customer toll free and calls taker process the input validate entitlement and create a case. The call is further processed based on the technicality of the problem whether it is application based or service related. Therefore it is dispatched to tier II level; there are two aspects of solving the problem even at this level. The problem can be resolved on phone call itself and hence, the case is closed. If it is not resolved, SWO is being released in order to ensure the availability of engineer. In case of non-availability of engineer, there is a check with TM/OPM for assigning the field service engineer (FSE) and this incurs the availability of engineer. There is a further check on whether the engineer is trained on that specific product. If he is trained and hence is assigned to do the task and in case of not being trained, it is captured (all cases) and informed to the concerned authorities.

The Field service engineer (FSE) further keeps a check based upon the requirement of the part. If there is any requirement of the part, he further checks if the customer is entitled for the part and hence everything is detailed at tier II level for Part request validation to order the required part. In case of non-requirement of the part the FSE closes the call on POLARIS (software) and CCC waits for the input from CHp manager/ML to close the call in SAP. In case of customer not being entitled for the part, FSE checks with RCSM for the approval.

When the part is to be ordered there is no intimation to ChP and FSE. If there is local availability of the part attaching the part with SWO is mandatory and informing CSL for further course of action. The CSL further checks with FSE on part movement and it move the part and hence inform FSE/CHP.

When the part finally moves at site and there is a closure of the call and FSE makes necessary entries in the Polaris and finally close the call. When the Chp manager/ML approves, the CCC consumes the part and closes it in SAP.

The whole process is designed for resolving a problem through this set of procedure. The FSE working is deficit in number in comparison to the amount of work they have to handle. Large number of working hours is added to their list.

WITH INITATION OF REMOTE SUPPORT SERVICE TO THE CUSTOMER:

Establishment of remote support forms the basis for streamlining the process in a more precise form. There are many problems which can be resolved without recurrent field visits. Remote support can bridge the gap by resolving the problem on the desk itself.

The process is planned in such a way that the problem can be solved partially by categorizing the calls. It is based on application or customer service related and can be some unknown problems which are not cleared at that point.

The application based problems can be further handled by categorizing them through

- Site only option
- Application specialist (Calls).

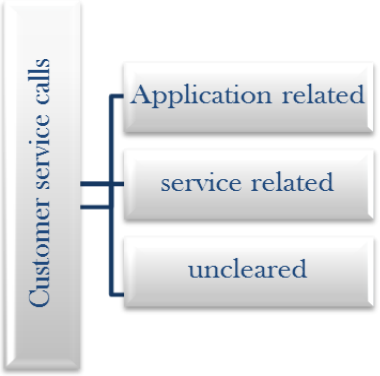
The application related calls can be further categorized to

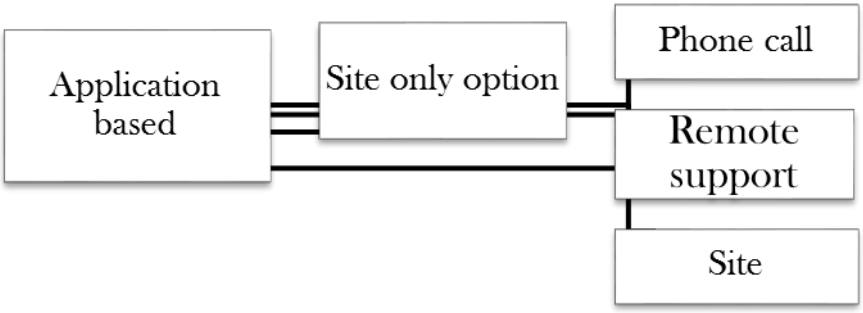
- Phone
- Remote support
- Site visit.

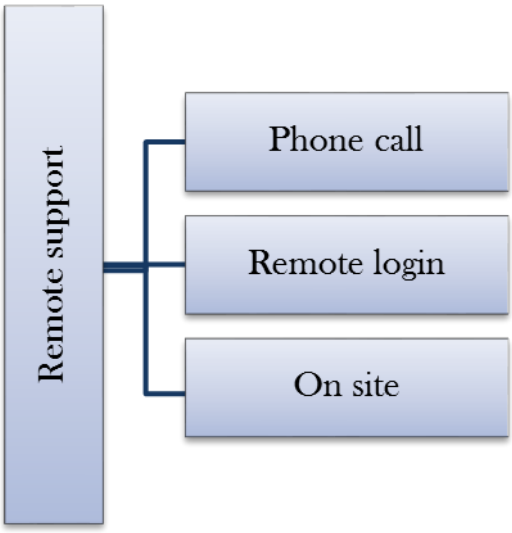
These problems are resolved at tier II level without proceeding further.

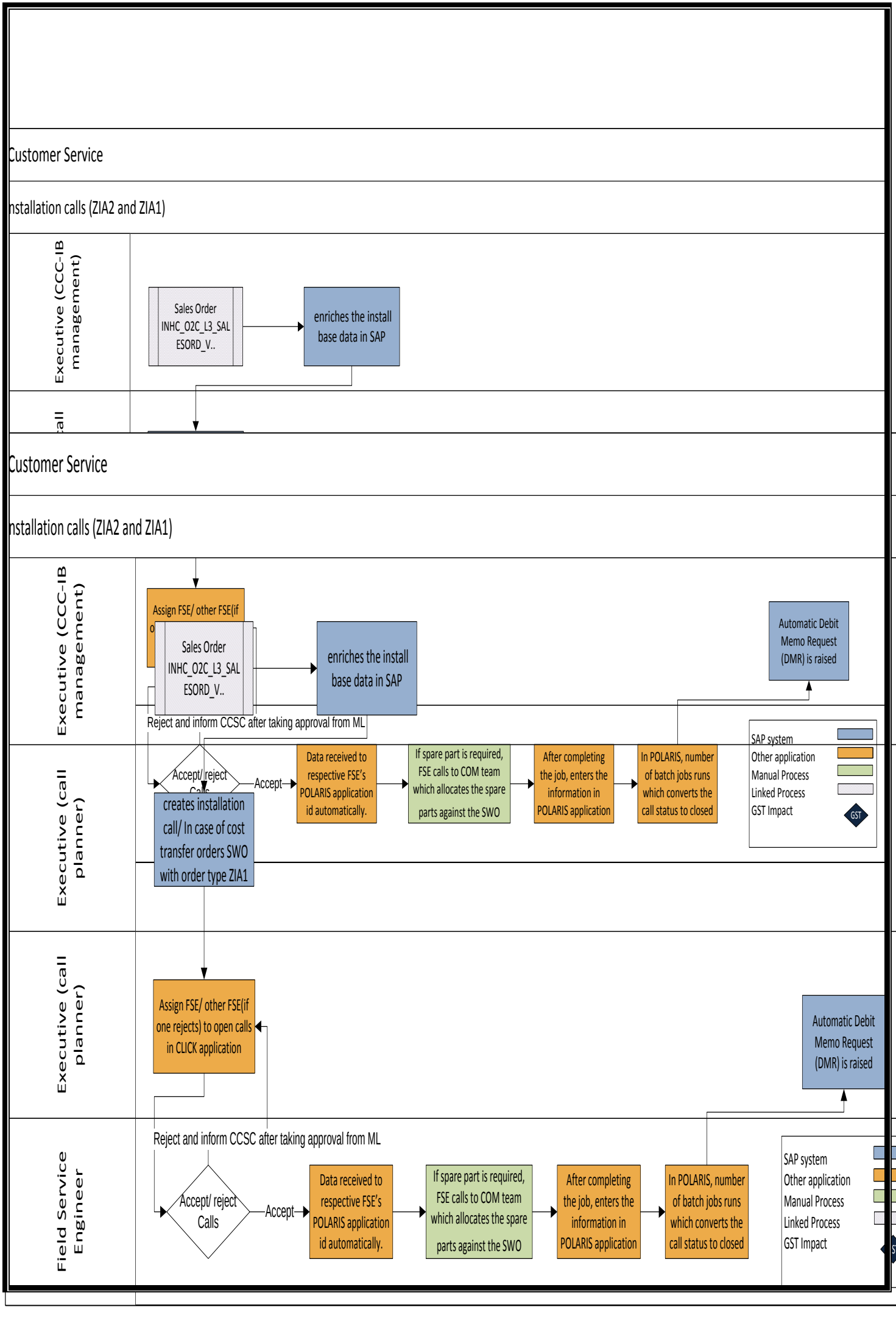
In remote support it can be categorized to

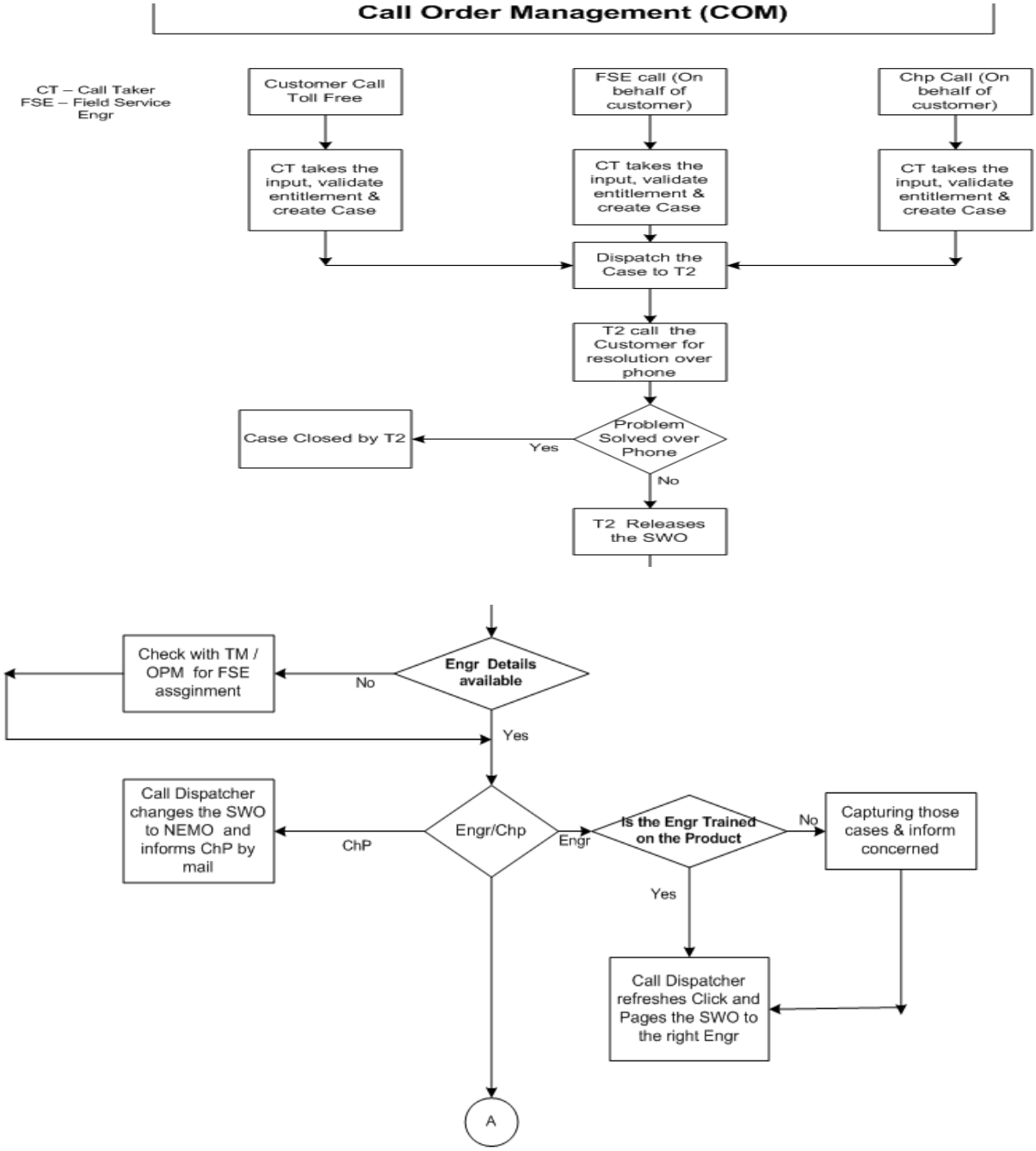
- Phone calls
- Remote log in
- Visiting the site.


Customer service calls
Application related
service related
uncleared

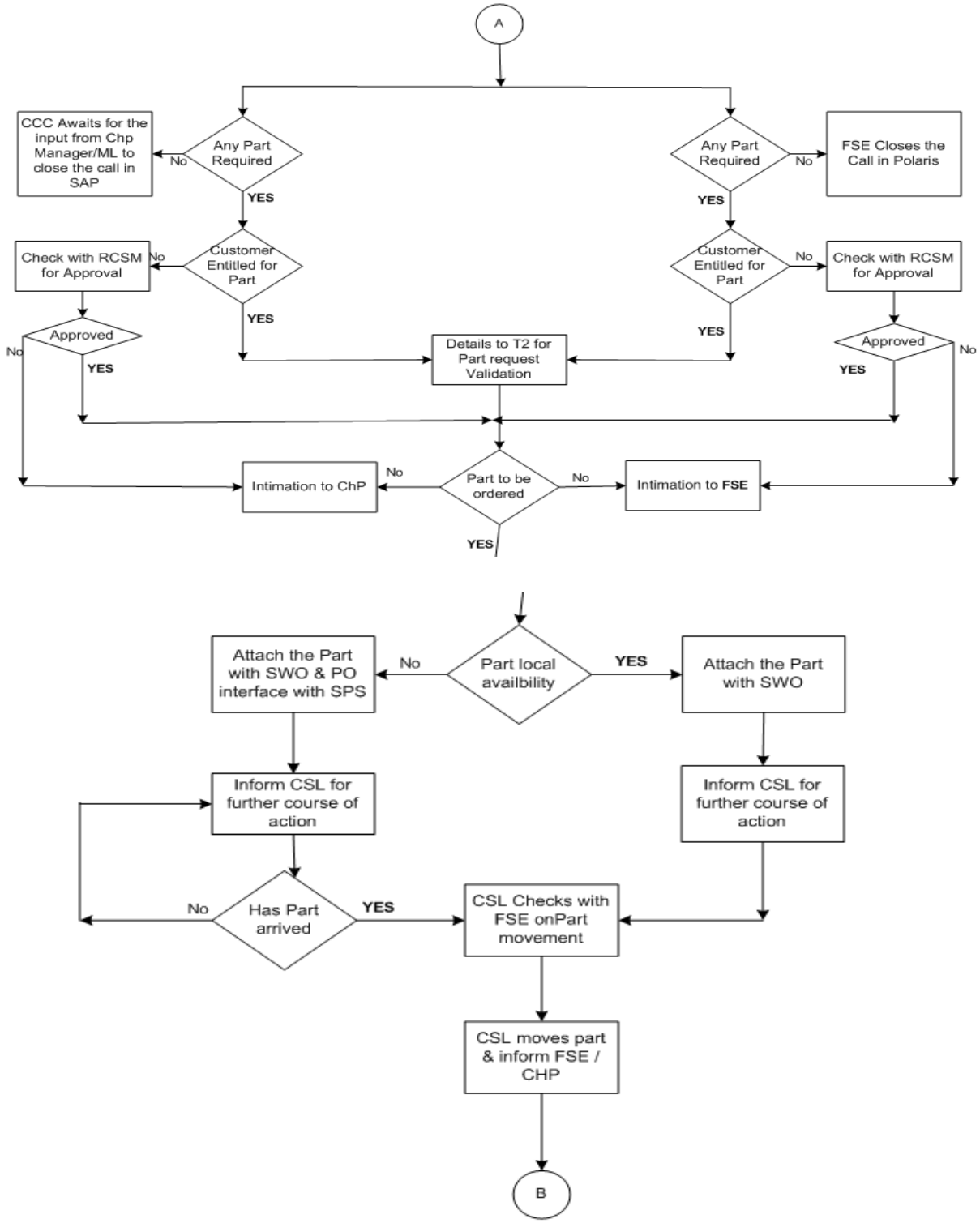

Application based
Site only option
Phone call
Remote support
Site

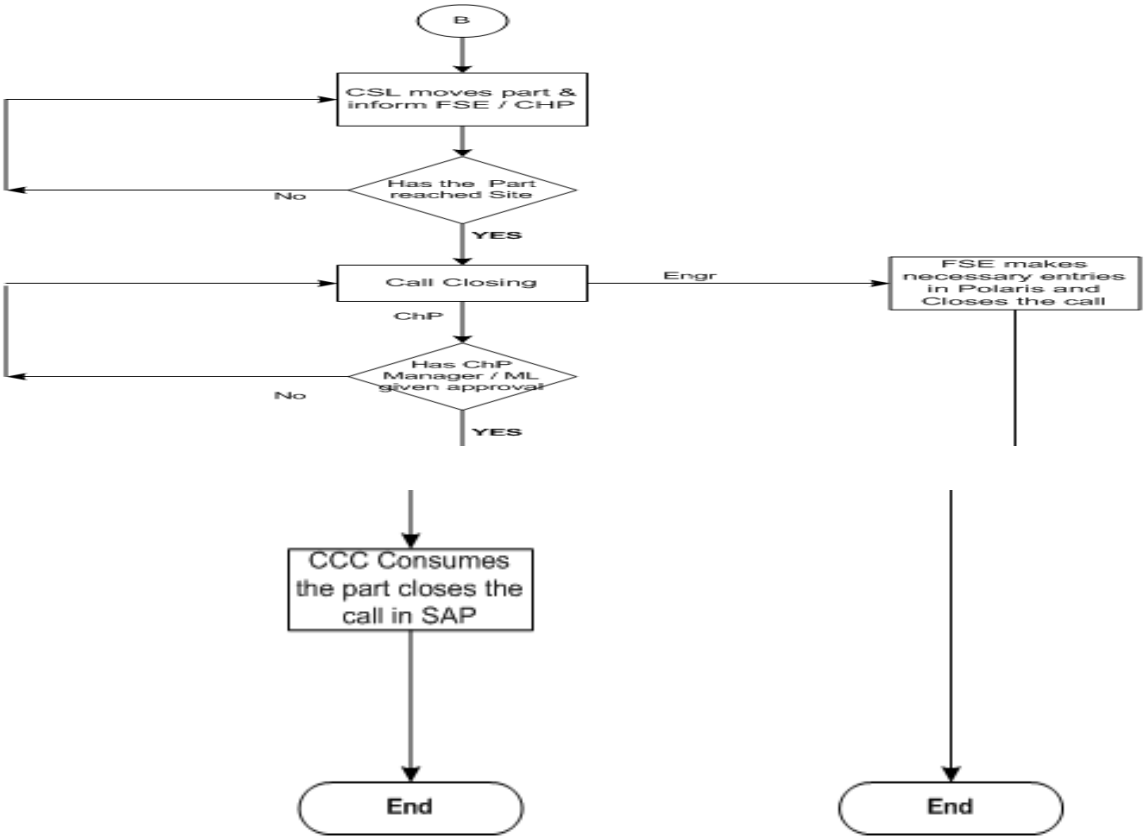

Remote support
Phone call
Remote login
On site


Customer Service
nstallation calls (ZIA2 and ZIA1)
Executive (CCC-IB management)
Sales Order INHC_O2C_L3_SAL ESORD_V..
enriches the install base data in SAP
Customer Service
nstallation calls (ZIA2 and ZIA1)
Executive (CCC-IB management)
Assign FSE/ other FSE(if
Sales Order INHC_O2C_L3_SAL ESORD_V..
enriches the install base data in SAP
Automatic Debit Memo Request (DMR) is raised
Reject and inform CCSC after taking approval from ML
Executive (call planner)
Accept/ reject
Accept
creates installation call/ In case of cost transfer orders SWO with order type ZIA1
Data received to respective FSE's POLARIS application id automatically.
If spare part is required, FSE calls to COM team which allocates the spare parts against the SWO
After completing the job, enters the information in POLARIS application
In POLARIS, number of batch jobs runs which converts the call status to closed
SAP system
Other application
Manual Process
Linked Process
GST Impact
GST
Executive (call planner)
Assign FSE/ other FSE(if one rejects) to open calls in CLICK application
Automatic Debit Memo Request (DMR) is raised
Field Service Engineer
Reject and inform CCSC after taking approval from ML
Accept/ reject Calls
Accept
Data received to respective FSE's POLARIS application id automatically.
If spare part is required, FSE calls to COM team which allocates the spare parts against the SWO
After completing the job, enters the information in POLARIS application
In POLARIS, number of batch jobs runs which converts the call status to closed
SAP system
Other application
Manual Process
Linked Process
GST Impact

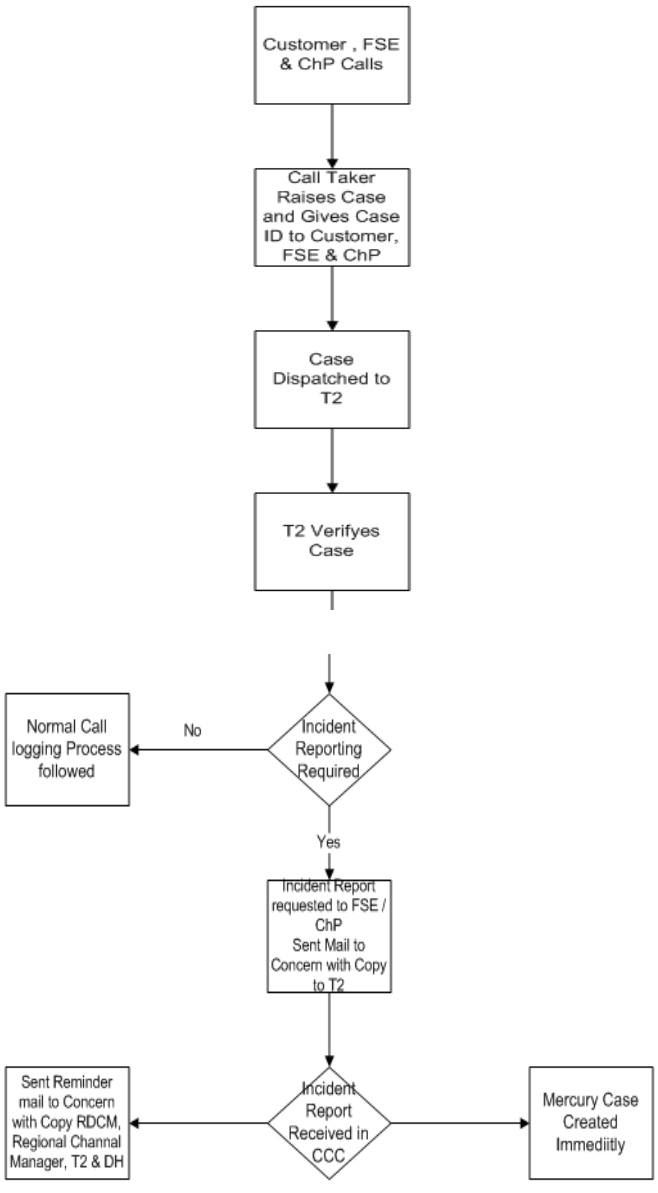


CALL ORDER MANAGEMENT PROCESS FOR SERVICE DELIVERY OF MRI

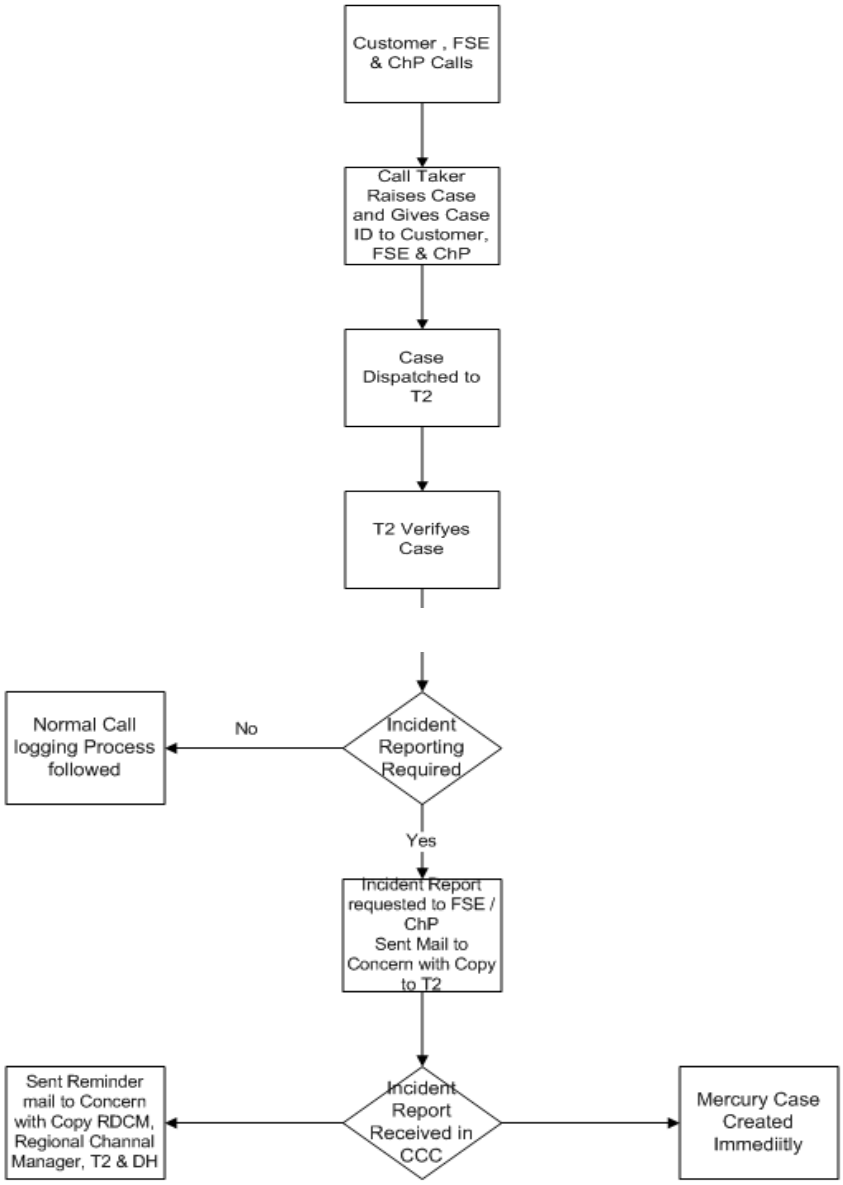

A
CCC Awaits for the input from Chp Manager/ML to close the call in SAP
Any Part Required
No
YES
Any Part Required
No
FSE Closes the Call in Polaris
YES
Check with RCSM for Approval
No
Customer Entitled for Part
YES
Customer Entitled for Part
No
Check with RCSM for Approval
YES
Approved
No
YES
Details to T2 for Part request Validation
Approved
YES
No
Intimation to ChP
No
Part to be ordered
No
Intimation to FSE
YES
Attach the Part with SWO & PO interface with SPS
No
Part local availbility
YES
Attach the Part with SWO
Inform CSL for further course of action
Inform CSL for further course of action
No
Has Part arrived
YES
CSL Checks with FSE onPart movement
CSL moves part & inform FSE / CHP
B


B
CSL moves part & inform FSE / CHP
Has the Part reached Site
No
YES
Call Closing
Engr
FSE makes necessary entries in Polaris and Closes the call
ChP
Has ChP Manager / ML given approval
No
YES
CCC Consumes the part closes the call in SAP
End
End

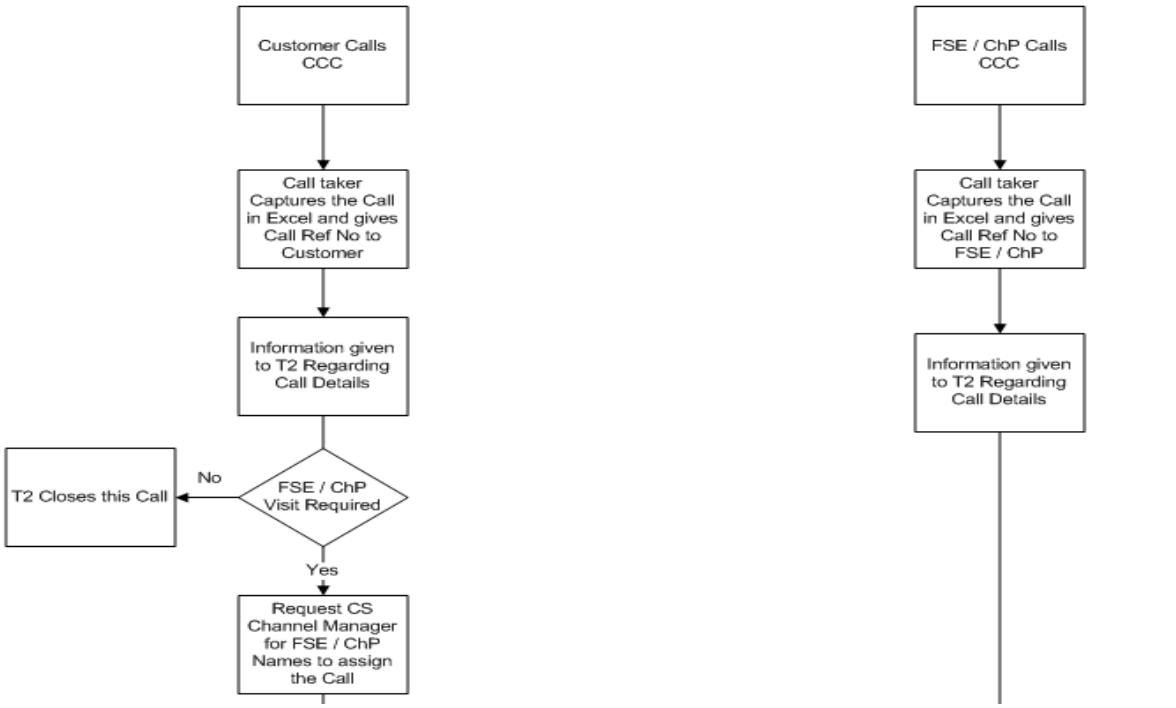
Mercury Call Logging for HSXL & MRS

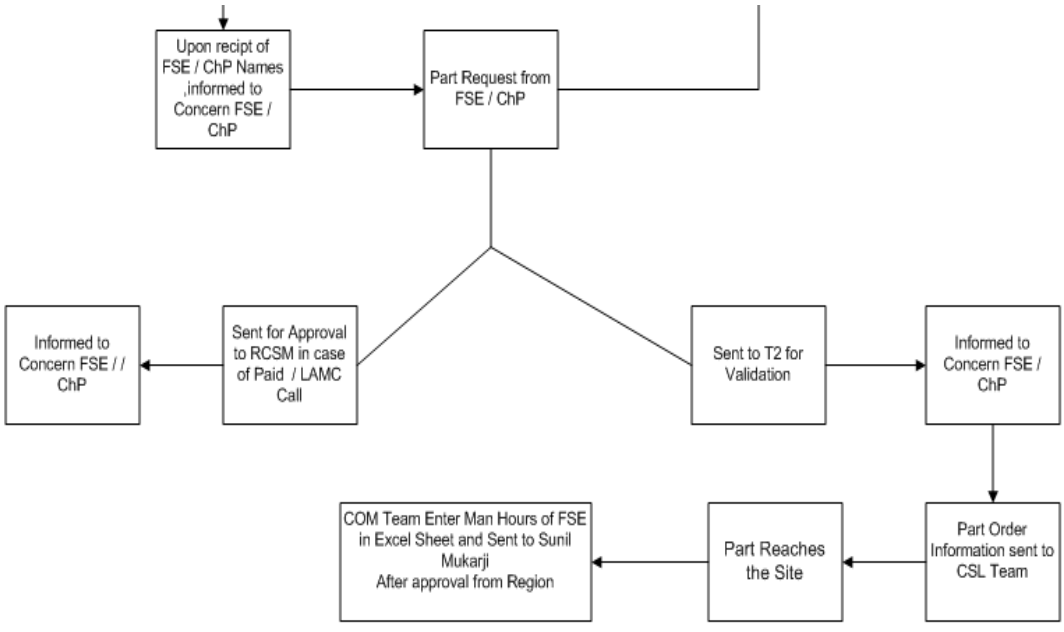


Mercury Call Logging for HSXL & MRS



Alpha, Meditronics & Respironics Call logging Process





SUBTITLE-3: TO STUDY THE TELE-ICU PROGRAM OF PHILIPS HEALTHCARE:

What is tele-ICU?

Tele-ICUs are networks of audio-visual communication and computer systems that link critical care doctors and nurses (intensivists) to intensive care units (ICUs) in other, remote hospitals. The intensivists in the "command center" can communicate by voice with the remote ICU personnel and can receive televised pictures and clinical data about the patients. Direct patient care is provided by the doctors and nurses in the remote ICU who do not have to be intensivists themselves. In recent years, there has been an increase in the number of patients needing ICU care without a corresponding increase in the supply of intensivists. Tele-ICUs offer a solution to this problem by enabling a relatively small number of intensivists to oversee the care of a large number of ICU patients [31].

How can Tele-ICUs help?

Telemedicine offers a means of leveraging intensivist coverage over more ICU beds. One physician and four nurses in one command center can oversee the care of up to 75 patients in distant ICUs. These clinicians are aided by "smart" databases that track patients' clinical values and give an alert when signs indicate a negative trend or when a change in treatment is scheduled according to protocol programs. The remote ICUs are staffed with physicians and nurses providing direct care to patients, but they do not have to be intensivists and they are also assisted by the computer alert systems [32].

Intensivist shortage limits ICU expansion and quality of care:

There is substantial evidence that today's highly complex ICUs are best managed by specialists in intensive care. For example, the Leapfrog Group(group for maintaining standards in quality and safety in critical care unit) has found that mortality rates are up to 30 percent lower and lengths of stay (LOS) up to three days shorter in ICUs managed by intensivists. The Leapfrog Group has made adequate intensivist staffing a criterion against which its payer members measure the performance of hospitals. At present, less than 10 percent of reporting hospitals meet these standards. There are simply not enough intensivists in practice to permit all hospitals that maintain ICUs to staff them with even one full-time physician intensivist. Only about 4,000 intensivist physicians are now practicing in ICUs in the U.S. and many of them work in other areas of critical care, such as emergency departments and burn units. The supply of intensivists is unlikely to be able to keep up with the surge of older patients [33].

Overview of technology:

A Tele-ICU system contains hardware that collects and assembles patient data and transmits it (including video and voice) from the remote ICU to the command center. The patient data include physiological status (e.g., EKG and blood oxygenation), treatment (e.g.,the infusion rate for a specific medicine or the settings on a respirator), and medical records. Ideally the hardware provides the clinicians in the command center and the ICU with the same patient data.

Hardware Components

- Computer systems to collect, assemble, and transmit information
- Communication lines
- Physiological monitors
- Therapeutic devices
- Medical records
- Video feed (with angle and zoom adjustments)
- Audio communications
- Video display panels

The software for a Tele-ICU includes the programs that make all the monitoring and information transmission hardware function properly. One challenge in developing Tele-ICU software is to enable it to interface with and electronically accept data from other electronic information systems that serve the ICU (e.g., laboratory results, medications, nursing flow sheets, physicians' notes, etc). As with many sophisticated software products, building connectivity with initially incompatible systems is possible but can take time and money. Furthermore, when systems are purchased from competing companies, additional software may be required to make them interoperable.

Software Components

- Software to operate hardware and enable data transmission
- Algorithms for alerting clinicians to potentially actionable situations
- Adjustable triggers for alerts and alarms

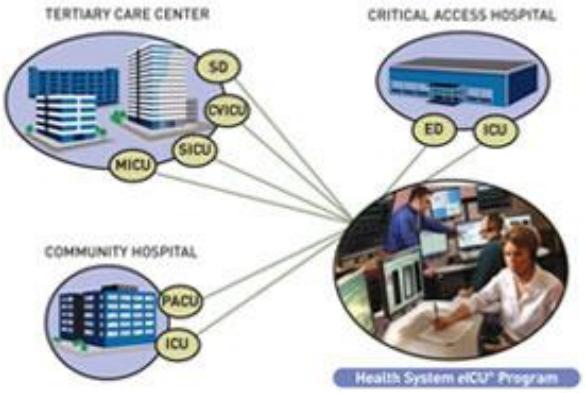
- Data capture and analysis capabilities to enable retrospective quality review and improvement.

TELE ICU PROGRAM OF PHILIPS HEALTHCARE:

Transforming care in critical care unit:

The e-ICU Program clinically transforms the ICU, using a proactive care model that provides a solution to growing physician and nurse shortages while dramatically improving quality of care. Through an ideal blend of medicine with technology, this care model leverages clinical expertise, patented processes, and cutting-edge technologies to improve critical care delivery.

e-ICU Program Outreach:



Extending e-ICU benefits beyond the health system:

Outreach enables health systems with an e-ICU Program to offer remote monitoring services to non-affiliated hospitals, leveraging referral patterns, generating new revenue streams, off-setting eICU operating costs, and increasing market penetration.

Technology options, such as the portable e-CareMobile solution, enable the extension of eICU Program benefits to healthcare facilities that could not realize them otherwise [34].

e-ICU Program Outreach can:

- Generate a new revenue stream
- Leverage e-ICU Program operating costs
- Increase referrals
- Expand geographic footprint
- Solidify market dominance
- Create market insulation
- Improve market awareness
- Enhance reputation
- Leverage existing infrastructure, procedures, and practices
- Help unaffiliated healthcare entities improve performance and save more lives

e-ICU Research Institute:

The e-ICU Research Institute delivers key critical care research and analysis to the healthcare industry using what we believe to be the most extensive ICU-centric longitudinal data set in existence. As part of the e-ICU Program, data collected across the entire customer base is aggregated to analyze Program effectiveness and provide benchmark reports on clinical best practices. The resulting database — now well past 1,500,000 ICU patient stays and growing at a rate of more than 400,000 per year — is unique in the depth of its clinical data.

Underwritten by Philips, but overseen and driven by customers, the e-ICU Research Institute leverages this de-identified, aggregated data to conduct in-depth analyses and academic research across a wide array of clinical topics. Results are used to drive additional product innovation. Most importantly, this research is intended to help the critical care community at large.

e-ICU Clinical Programs:

Philips works hand-in-hand with its respective customers to improve and expand operations of the e-ICU Program. e-ICU Clinical Programs leverage a health system's eICU Program investment to better address clinical and operational challenges [35].

e-ICU Sepsis Management Program:

The eICU Sepsis Management Program combines eICU technology with proven processes and Surviving Sepsis Campaign recommended sepsis treatment bundles to drive a standardized approach to severe sepsis identification and treatment in a unit or across a health system.

The Sepsis Program increases clinician collaboration and cooperation while driving quicker identification and intervention in the treatment of severe sepsis.

e ICU Length of Stay Management Program:

The eICU Length of Stay (LOS) Management Program is an organized and focused approach for reducing ICU length of stay and improve financial outcomes. The LOS Program makes use of a health system's eICU Program to coordinate the appropriate level of care delivery for each patient.

The decreased ICU length of stay without increasing mortality or morbidity, improved ICU capacity and throughput, and reduced cost per case.

Decision Support Tools:

Enabling more informed decisions for better outcomes

Smart Alerts Prompts

Smart Alerts use sophisticated algorithms to detect and advise eICU clinicians to important trends and changes in the patient's condition, enabling more proactive care with fewer complications.

Reports

The eICU Program's extensive reporting – including daily management and ICU benchmarking of outcomes – sets it apart from other critical care solutions.

The Source

The Source is a point-of-care decision support system that integrates clinical practice guidelines with patient data to guide treatment and care of patients.

e- ICU PROGRAM OUTCOMES [36]:

The eICU Program was recognized by Wall Street Journal as one of six leading innovations that can have a dramatic impact on healthcare and "help reach the goal that continues to elude policy makers, getting good care to the greatest number of people in the most cost-effective way."

Patient Outcomes:

- 37 - 64% decrease in mortality.

Financial Outcomes:

- $8 million savings attributed to reduced ICU days.

Operational Efficiency:

- Leveraging scarce resources to reduce costs.

Strategic Impact:

- Increased competitive advantage.

SUBTITLE-4: TO DEVELOP A FRAMEWORK ON DATA MANAGEMENT POLICIES FOR CLINICAL INFORMATICS PRODUCTS OFFER BY PHILIPS HEALTHCARE

STUDY PURPOSE:

Philips healthcare as a vendor offer wide range of clinical informatics products. Therefore, as a vendor they need to provide robust data management policies for their respective products and solutions.

STUDY DESIGN: Designing the structured "control list" for data management policies in order to provide secured configuration for protecting data.

	POLICY/PROCEDURE	CONTROL
1.Data management, security and integrity	Data management policy	a)Data frame work committee
		b)Principles of data management
		c)consistent data security at different levels such as
		d)public data, general administrative data,
		Protected data and restricted data.
		e)Efforts to maintain the integration of data
		f) Architectural tools for constantly developing information architecture.
	Data security	g)Access control list
		h)Record opening
		i)control

		J)Attribution
		K)Consent/Notification
		l)Attribution
		m)Information flow
		n)Aggregation control
		o)Trusted computing base
		p)computer security mechanisms
	Data integrity	q) Network based/host based intrusion detection system
		r) IT vendors release fixes to address known bugs or problems.
		s)Expulsion of strong magnetic fields
		t) Prevention of poor data integration between different computer
		System.
2.Risk analysis	uniform security policy	a) Risk assessment constitutes system inventory
		b) Identification of workforce members and information owners
		c) Security control analysis/changes
		d) Determine vulnerability impact
3.Audit control	Audit procedure	a)Log content specification
		b)sharing logs/logs reporting
		c)failed logins/logins at inappropriate hours
		d)Investigation/mitigation, control for inappropriate use and disclosure
		e) Capability to change audit criteria and what it is tracked
	Audit policy	f)log in monitoring
		g)Information system review

		h)security audit practice
		i) Audit Trail and Node Authentication (ATNA)
	periodic internal compliance Audits	j)Audit controls
		k) subject of care identity
		l) Auditing access where Individual authorization or consent is required
		m) Audit log process
		n) system capabilities
		o) Audit log content
		p) Information integrity
		q) Data authentication
		r) Data validation
		s) list of terms
4.Authorization and access control	Authorization policy	a)License or credential checking
		b)Use of digital certificates
		c)System certification
		d)Automatic checks for changes
		e)Role management
		f)User management configuration
		g)Reconciliation management
		h)functional management
	Access control	I)Role definition
		j)Web, intranet, or closed network
		k)Create amendments
		l)Modify system software file
		m)Modify system configuration file
		n)Create system reports
		o)Modify user profile

5.Authentication of data	Authentication policy	a)Agreement usage
		b)Registration identity
		c)Role based access
		d)User Authentication
		e)System authentication
		f)organization authentication
		g)Restricted Data Sharing and Data Integrity
	Encryption	h)Encryption key
		I)Installation of authentication and encryption
		Certificates
		j)Use of WinZip encrypted and zipped e-mail
		K)secured File transfer protocol (sftp)
6.Hardware maintenance	Hardware security protection	a)Virus protection
		b)VPN and firewall use
		c)security locks and locking screens
		d)Emergency Remote Support
		e)Non-Emergency Remote Support - Response Time
		f)Update and Upgrade Coverage
7.Break Glass feature	Information security access conformance	a)Division-level or facility-level contracts
	and monitoring	b)Division authorized to sign legal contracts
		c)legal counsel

		d)Accompany New or Existing Master agreement
8.Diaster recovery	Disaster recovery plan	a)Administrative, technical and physical safeguards
	Planning team	b)Ensuring its confidentiality, Integrity and availability
		c)Prevention of unauthorized or inappropriate access, use or disclosure
	Company personnel	d)Administrative requirements
		e)workforce and training sanctions
		f)Complaint process
		g)Mitigation
		h)Accountability and the business associate agreement
9.Regulatory compliance	HIPPA right to access	a)Request for access
		b)timely action
		c)Provision of access
		d)Designated record set
	Denial of access	e)unreviewable grounds for denial
		f)Reviewable grounds for denial
		g)Implementation of denial
	Openness and transparency and HIPPA	a)HIPPA Notice of privacy practices
	privacy rules	b) HIO-X(Legal entity).
	safeguards and the	a)Administrative, technical and physical

	HIPPA privacy rules	safeguards
		b)Ensuring its confidentiality, integrity and availability
		c)Prevention of unauthorized or inappropriate access use or disclosure
	Accountability and HIPPA privacy rules	a)Administrative requirements
		b)workforce and training sanctions
		c)compliant process
		d)mitigation
		e)accountability and business
		f)Associate agreement
10.Vendor information security	Vendor information security agreement	a)Division level or facility level contracts
		b)Division authorized to sign legal contracts
		c)legal counsel
		d)Accompany New or Existing Master agreement

RESULTS:

Various tasks that were assigned have been fulfilled encompassing understanding the process of data base, testing the data base application, understanding the MRI application support log process, studying the process

DISCUSSION

The present study about the ongoing projects in Philips healthcare seeks to understand the various process improvement steps that Philips healthcare is undertaking in order to enhance the existing system.

Philips healthcare is mammoth organization which strategically plans its business process in order to expand its market segmentation and growth. The various subtitles of the ongoing projects determine the various objectives that Philips healthcare have achieved.

The first objective was to develop a database to in order to track the demo assets being transported to the customer, to keep a track on these particular items.

The second objective was to study the remote log support system of MRI machine in order to enhance the service delivery process for the customers who are using the same.

The third objective was to study the tele-ICU program which Philips healthcare has commenced.

The fourth objective was to develop the frame work of "controls" for data management policies in order to strengthen the policy system for the clinical informatics products they offer.

All the objectives have been achieved at a disparate level.

CONCLUSION

To conclude it can be said that various objectives of the project have been achieved as per the tasks being assigned.

Philips is a mammoth organization where strategic planning of business development is always a continuous process. All the objectives have been achieved at a disparate level which can consider being a limitation of the study.

Henceforth, the implementation of the these projects at various levels resolves an objective that Philips healthcare has commenced.

RECOMMENDATIONS

Recommendations are provided at various depending upon the nature of the objectives being attained.

- There should be flexibility for entering the data in database application for tracking the demo assets pertaining to material management.
- For MR application support log, the applicability of the same software should have been provided for remote log in for resolving the problem through it.
- There should be more robust data management policies for the wide range of products and solutions pertinent to Clinical Informatics

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CASE STUDY

INTRODUCTION

People Focused:

"At Philips Healthcare, we combine our unique clinical expertise with human insights to develop solutions that deliver value throughout the care cycle: from disease prevention to screening and diagnosis, through to treatment, monitoring and health management – wherever care is given: in the hospital or at home."

There was a time, before the era of clinical informatics innovations in technology were not associated with evidence based clinical interventions and hence the innovation of health care diagnostic machines were not aligned to the patient satisfaction in terms of information management.

With the introduction of clinical informatics, data management is done efficiently and the drive is more towards achieving patient satisfaction versatile data management techniques

Various studies believe that the key tools for closing this gap will be information systems that provide decision support to users at the time they make decisions, which should result in improved quality of care.

The American Medical Informatics Association (AMIA) convened a 2008 Health Policy Conference to focus discussions and advance understanding about the potential for informatics-enabled evidence-based care, clinical research, and knowledge management. They explored the applicability of informatics tools and technologies to improve the evidence base on which providers and patients can draw to diagnose and treat health problems.

Improved efficiency and effectiveness of care relies on the best information being available and readily accessible by health professionals and patients to use in making decisions. An underlying series of complex processes is required for this to happen via basic, translational, and clinical research: collecting patient data and making it available to researchers and clinicians; organizing the information that is needed for clinical decision making; creating methods to effectively disseminate the information; and capturing the results of decisions so that this information is available for new analyses and future cycles of improvement.

With the gradual evolution in clinical informatics various business organizations have reached a reached a transitional phase from merely coming up with latest innovations to becoming customer driven and hence forth satisfying patient's needs and delivering services at the point of care.

Therefore the main objective of this case study is to understand how Philips has eventually progressed in different areas of health care by introducing its broad range of products and solutions that are being delivered to satisfy the needs of patient who seeks treatment and therapies in various department of hospital.

Therefore the study describes the latest innovations of product and solutions that Philips healthcare has brought into the market pertinent to clinical informatics aligned and attracted its costumers all across the world with its customized features.

METHODOLOGY

The study about the broad range of product and solutions offer by Philips healthcare which are being used in accordance to evidence based intervention by incorporating clinical informatics.

STUDY DESIGN:

- Quantitative study based on convenient sampling, a questionnaire was designed and filling it from service providers and internal employees of Philips health care in terms of product and process improvement.

- Likert scale is used in some of the questions in the questionnaire.

SAMPLE DESIGN:

Convenient sampling has been chosen for undergoing this study.

The sample size of twenty eight (28) has been taken in to consideration which constitutes health care providers and Philips internal employees.

Health care service provider constitutes

- Doctors
- Nurses
- Administrators and technicians

Philips internal employees constitutes

- Employees from sales and maintenance

STUDY AREA:

- Philips electronic India limited (PEIL), (Gurgoan).
- Hospitals from different location of Delhi (healthcare service providers)

STUDY FINDINGS OF THE STUDY:

The graph of sample size is represented in the following manner.

Twenty eight were respondents chosen for the survey.

They mainly constitute healthcare providers and Philips internal employees.

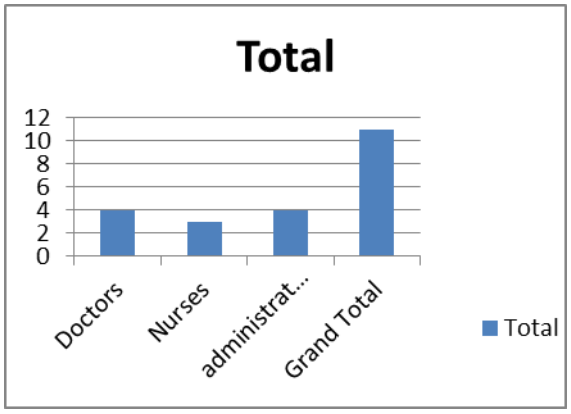
Healthcare providers include doctors, nurses, administrators and technicians and Philips internal employees include from sales and maintenance. A questionnaire has been circulated among these respondents in order to assess about technological advancements in the products and solutions offer by Philips healthcare.

A questionnaire constitutes ten to twelve (10-12) which is applicable to both the set of people. The analysis reveals some interesting facts about technological advancement in the products and solutions offer by Philips healthcare.

Likert scale has been used in some of the questions in order to assess the changes in the percentage to quantify the advancement in medical technology in products and solutions offer by Philips healthcare.

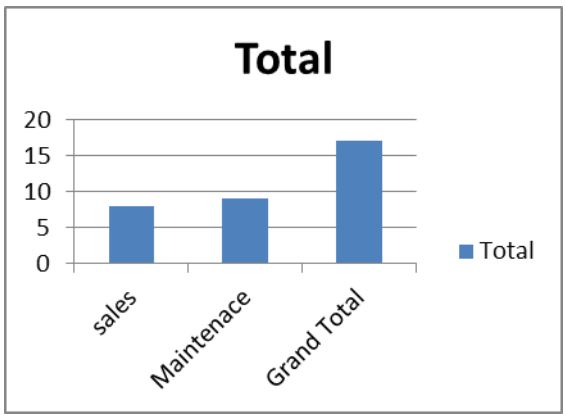
Total number of healthcare providers among respondents:

Healthcare providers	Total
Doctors	4
Nurses	3
Administrators and technicians	4
Grand Total	11

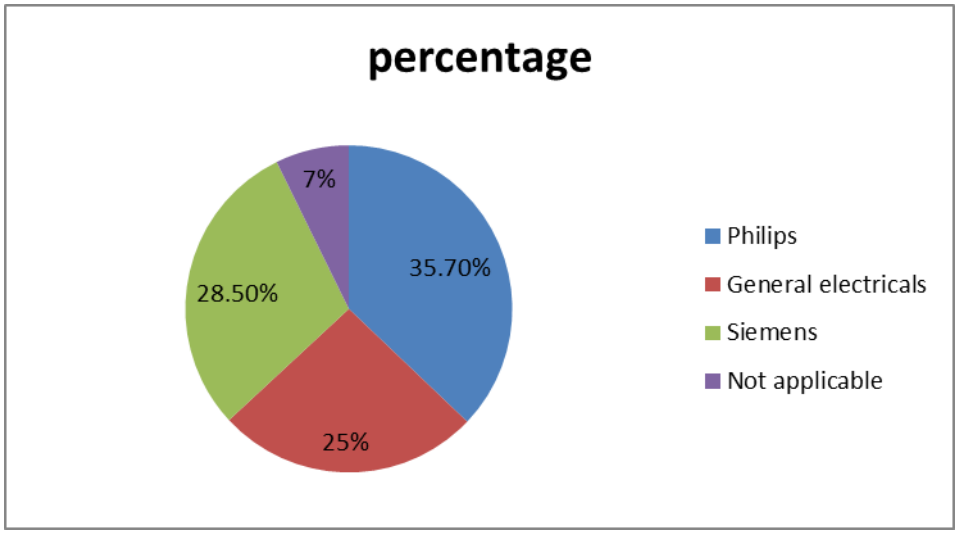


Philips internal employees:

Philips internal employees	Total
sales	8
Maintenance	9
Grand Total	17

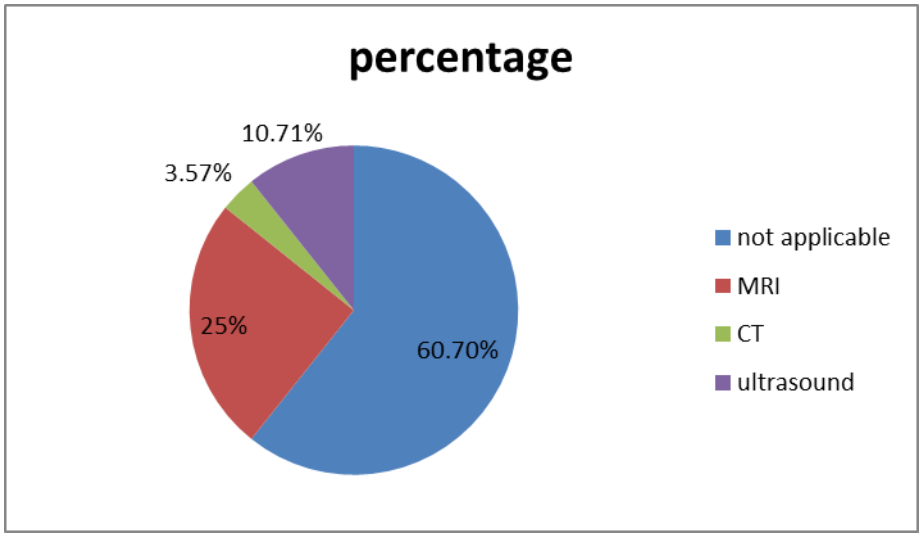


CONSIDERATION IN TERMS OF MARKET LEADER:



With the transition in terms of all medical advancements and innovations, Philips is considered to be a market leader with a majority 35.7% of people considered it as compared to its competitors.

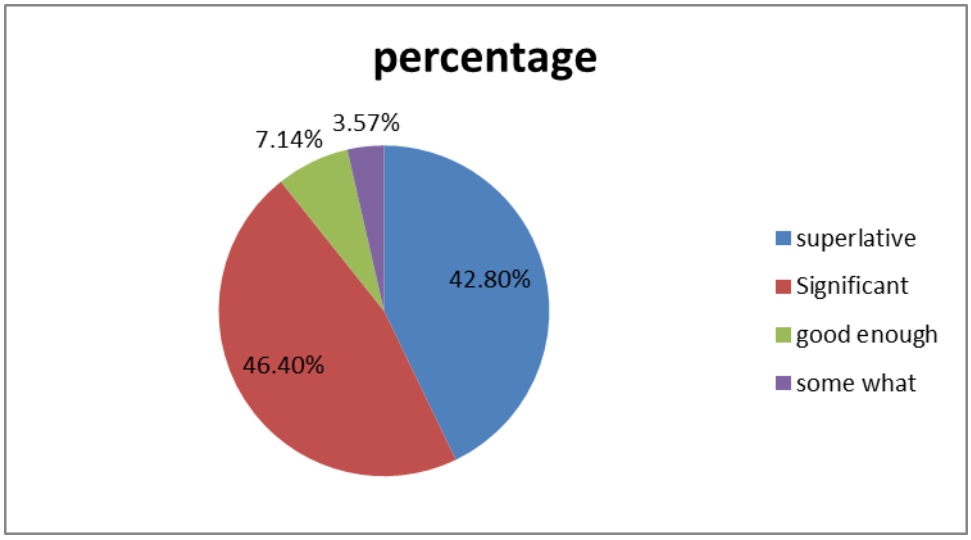
PHILIPS MODALITY USED BY SERVICE PROVIDERS:



Twenty five (25%) of service providers (doctors) are using MRI, almost four percent (3.57%) are using CT scan machines and almost eleven percent (10.71%) are using ultra sound.

Rest of the respondents is not applicable since they are Philips internal employees.

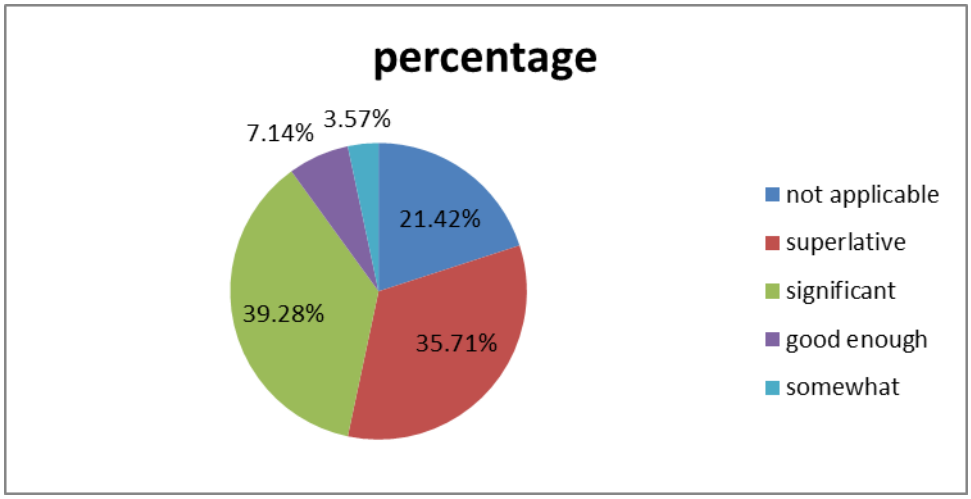
ANY SIGNIFICANT IMPROVEMENTS IN THE PROCESS AND PRODUCTS (TECHNOLOGICAL ADVANCEMENTS AND INNOVATIONS) OF PHILIPS:



Likert scale has been used for some of the questions in the questionnaire

The percentages suggest that there have been significant improvements in terms of process and product of Philips healthcare.

PROCESS IMPROVEMENT IN TERMS OF MAINTENANCE ENGINEERING AND CUSTOMER SUPPORT IN PRODUCT USABILITY AND SERVICES:



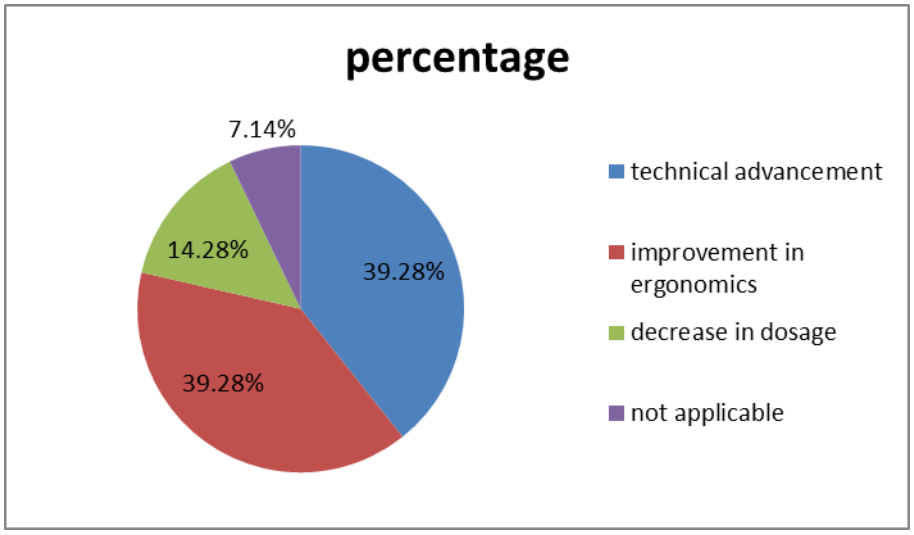
There is a considerable enhancement in terms of maintenance engineering and services in terms of product usability and services.

Almost thirty six (35.71%) chose to answer superlative, which is highest degree of Likert scale and almost forty (39.28%) chose to answer significant.

The proportion and percentage of superlative and significant is significantly high as compared to any degree of Likert scale.

This proves that there has been significant amount of enhancement in terms of maintenance engineering and services in terms of product usability and services.

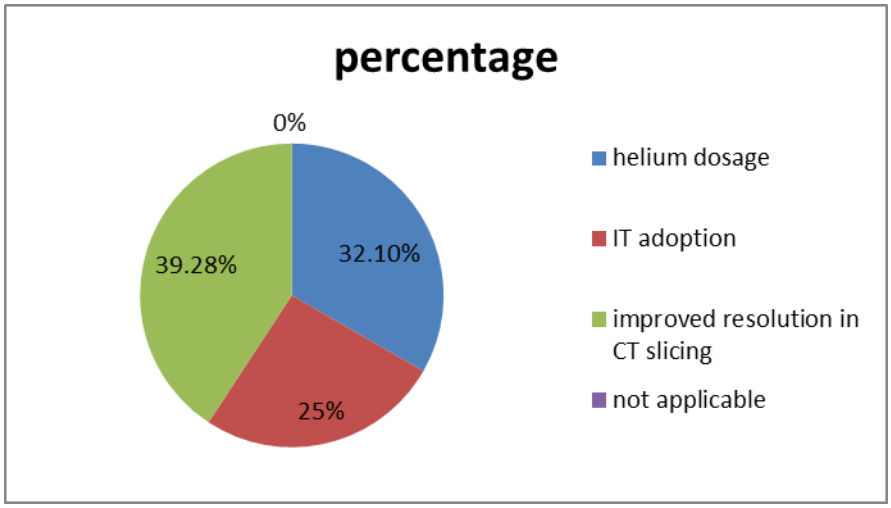
CHANGES IN ADVANCMENT IN PHILIPS PRODUCT:



This question categorized the advancements at different levels constituting technical advancement, usability and dosage.

Almost forty percent (39.28%) chose to answer development in terms of technical advancement and improvement in ergonomics.

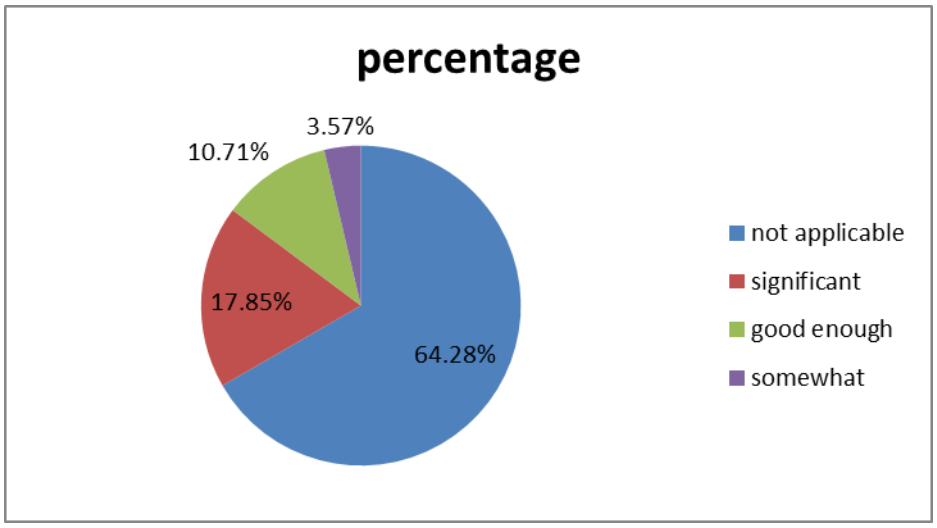
TECHNICAL ADVANCEMENT OF THE PHILIPS PRODUCT:



Technological advancement comprises of improved CT slicing resolution or lower need of helium for superconducting. It also includes improved adoption of information technology (IT) such as usage of Picture archival and communication system (PACS).

Almost thirty two percent (32%) chose to answer reduced dosage of helium for superconducting in MRI magnets, thirty nine (39%) answered improved resolution in CT slicing and twenty five (25%) answered improved adoption in information technology (IT).

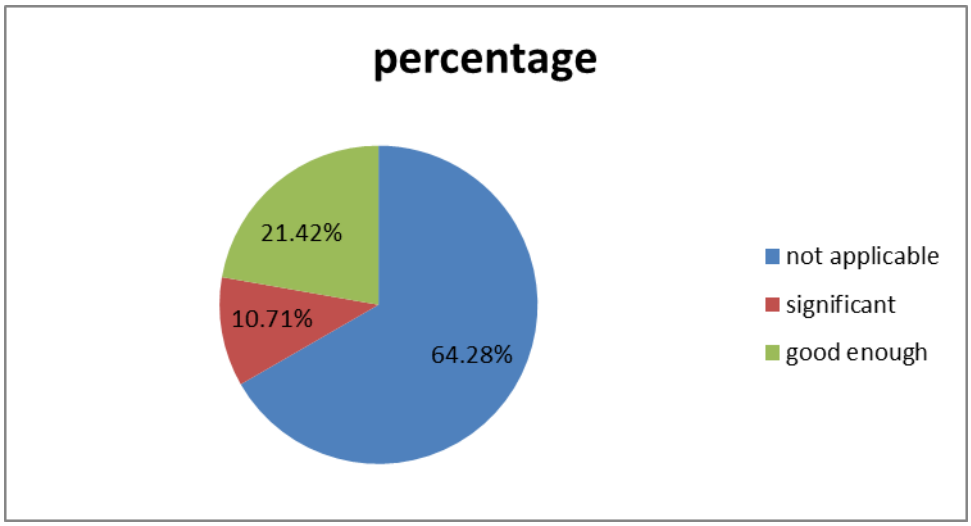
CAPTURE OF CLINICAL DATA THROUGH COMPUTERISED PHYSICIAN ORDER ENTRY SYSTEM (CPOE)



Almost sixty four percent (64%) respondents are not applicable as they are not service providers. Almost eighteen percent (18%) of respondents answered significant amount of capturing of data through CPOE who are service providers.

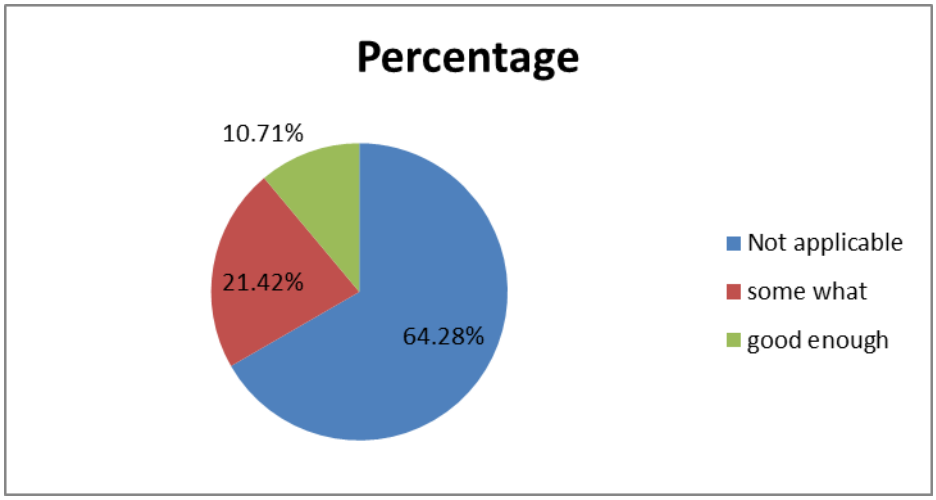
According to almost eleven percent (11%) of respondents consider it good enough as per Likert scale and almost four percent (3.57%) of candidates consider "somewhat" as per the Likert scale.

EVIDENCE BASED PRACTICES THROUGH CAPTURING OF CLINICAL DATA:



Evidence based practices are not followed to a great extent. Only almost eleven percent (10.71%) of respondents who are service providers answered to a significant level and almost twenty two percent (22%) answered to "great extent "as per Likert scale.

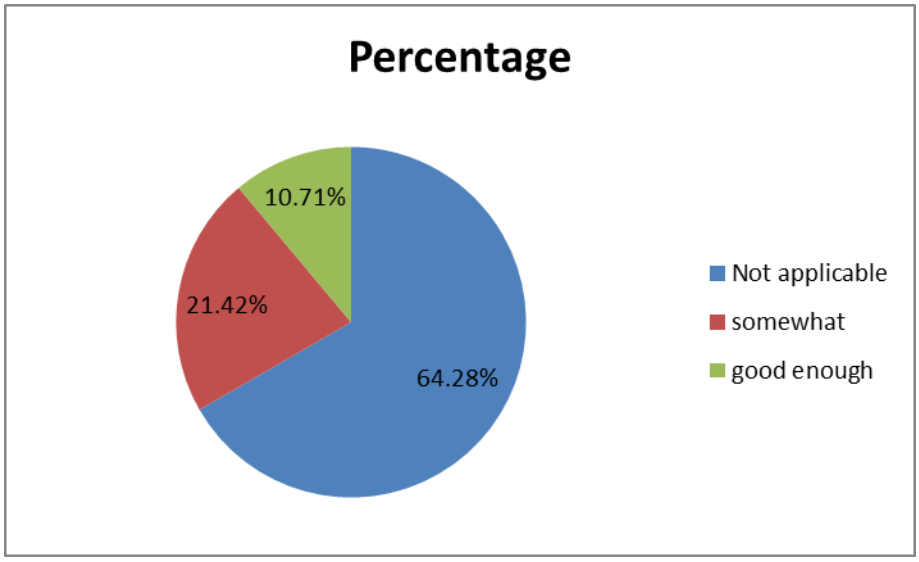
DIGITAL REPOSITORY OF DATA OFFERED TO PATIENT OPTIONALLY:



Almost sixty four percent of respondents (64.28%) are not applicable as they not healthcare service providers and twenty one percent (21.42%) answered somewhat as per Likert scale.

Rest of the respondents, almost eleven percent (10.71%) answered good enough as per the Likert scale.

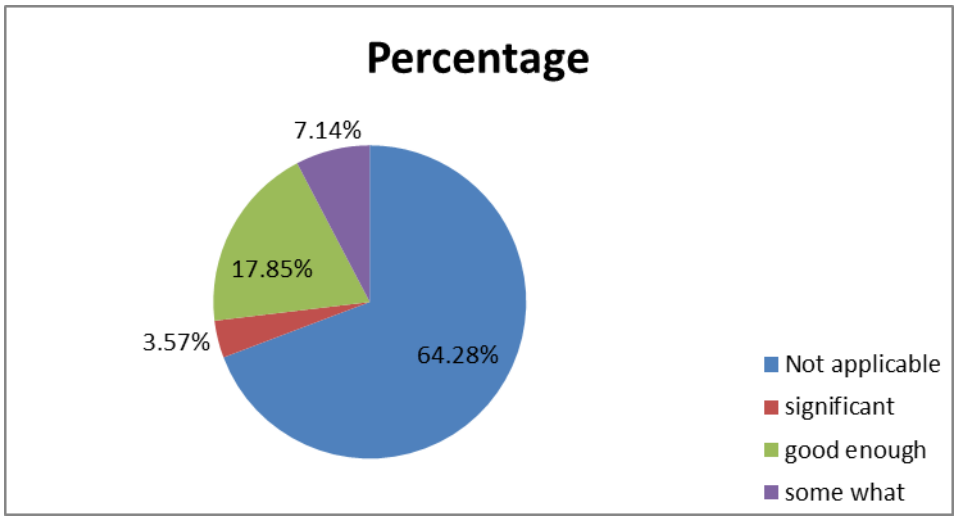
HEALTH INFORMATION TECHNOLOGY (IT) STANDARDS ENSURING INTEROPERABILITY:



Almost sixty four percent (64.28%) were not applicable they were Philips internal employees, not healthcare providers.

Only eleven percent (10.71%) of respondents answered “good enough” as per Likert scale and almost twenty one percent (21.42%) respondents answered “somewhat” which is a significant amount (number of respondents answered) to make an effort to improve the interoperability ensuring health IT standards.

OPERATING ELECTRONIC HEALTH RECORD MAINTAINING DATA SECURITY, PRIVACY, TRUST AS PER THE COMPLIANCE OF HIPPA REGULATION:



Almost sixty four percent (64.28%) of respondents were not applicable as they were not healthcare providers.

Only four percent (3.57%) answered the level “significant” whereas almost eighteen percent (17.85%) of respondents answered the level “good enough”. Similarly almost seven percent (7.14%) answered “somewhat” as per the Likert scale.

DISCUSSION

The present study seeks to understand the increased continuum of care with enhanced technological innovations and improved adoption of healthcare IT resulted in extensive quality of care among healthcare providers.

The data from the primary study can help in assessing the various technological transitions happened through advancements in the medical equipment's of Philips healthcare.

Adoption of Information technology (IT), advanced CT resolution and lower usage of helium for superconducting in MRI is the result of transition in technological innovations in healthcare.

As per the Likert scale, significant improvements in the process and products (technological advancements and innovations) of Philips is almost forty three (42.8%) and forty six (46.4%) respectively.

The highest proportion of Likert scale is significant and superlative which is almost thirty six percent (35.71%) and forty percent (39.28%) respectively. This percentage implies the process improvement in terms of maintenance engineering and customer support in product usability and services.

Whereas, some of the questions are not applicable questions pertaining to data capturing, interoperability, computerized physician order entry (CPOE), evidence based practices were not applicable to most of the respondents since they were not healthcare providers.

The market growth in terms of medical equipment offered by Philips healthcare and its investment for effective information system resulting in better clinical outcomes at the point of care.

The various key marketing and business strategies have been instrumental in order to be one of the market leaders in various medical equipment's.

Development groups, product management and processes are optimized to achieve the best performance customers can buy. This has resulted in performance leadership in all major modalities.

The major focus in information technology (IT) is towards departmental clinical applications and therefor it has become easy to it for healthcare providers to easily integrate evidence into practice.

Philips invest almost seventy eight(78) billion in health IT in order to make technology that can serve as a conduit that links better information with better health outcomes.

RECOMMENDATIONS

- Evidence based practices through capturing of clinical data needs to be enhanced, the degree of ‘significant’ as per the Likert scale is quite less which is almost eleven percent (10.71%).

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ANNEXURE

QUESTIONNAIRE DESIGNED FOR THE STUDY:

1. Who do you consider the market leader in terms of medical diagnostics and equipment's?
1) General electricals(GE)
2) Siemens
3) Philips
4) Not applicable
2. Which modality of the Philips product you have used?
1) Ultra sound
2) CT
3) Digital radiography (DR)
4) MRI
5) PET
6) Cath
7) Not applicable
3. Any significant improvements you have noticed in terms of Product and Process in Philips healthcare?
1) Nil
2) Some what
3) Good enough
4) significant
5) superlative
6) not applicable
4. Is there any process improvement in terms maintenance engineering and customer support to strengthen the product usability and its services?
1) Nil
2) Some what
3) Good enough
4) significant
5) Superlative

6) Not applicable
5. What are the changes did you observe in Philips product?
1) Decrease in Dosage
2) Improvement in ergonomics(usability)
3) Technical advancement in the product
4) Not applicable
6. What are the technical advancements did you observe?
1) The dose of helium has been reduced for super conducting
2) Increased adoption of IT such as usage of PACS(picture archival communication system)
3) Improved resolution in CT slicing
4) Not applicable
7. Is there any implementation of health information system (HIS) and capture of clinical data through CPRS (computerized order physician entry)?
1) Nil
2) somewhat
3) Good enough
4) significant
5) superlative
6) not applicable
8. Is there any implementation of computerized physician order entry (CPRS)?
1) Nil
2) Somewhat
3) Good enough
4) Significant
5) Superlative
6) not applicable
9. Any improvement in evidence based practices is carried out through capturing of data from electronic health record?

1) Nil
2) Some what
3) Good enough
4) Significant
5) Superlative
6) Not applicable
10. Is there any Digital repository of electronic data offered to patient optionally?
1) Nil
2) Some what
3) Good enough
4) significant
5) superlative
6) Not applicable
11. Is there any adherence to health IT standards for ensuring interoperability in health information exchange with other HIS providers?
1) Nil
2) some what
3) good enough
4) significant
5) superlative
6) Not applicable
12. Is there any Optional capability of hosting electronic health record maintaining data security, privacy and trust as per the compliance of HIPPA regulation?
1) Nil
2) somewhat
3) good enough
4) significant
5) superlative
6)) Not applicable