



Global Portable Imaging Solutions Market

Focus on Product Type, End-Users,
Competitive Landscape, 22 Countries
Data – Analysis and Forecast,

2018-2028

December 2018



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Preface

Diagnostic imaging tests are non-invasive procedures that aid in the visualization of internal body parts, tissues, and organs for clinical evaluation, diagnosis, and disease monitoring. The diagnostic imaging sector covers several sub-domain specialties such as radiology, optical imaging, nuclear medicine, and image-guided intervention, among others.

The diagnostic imaging systems not only aid in the detection of diseases, but also offer assistance in clinical evaluation of therapeutic and post-therapeutic changes and treatment complications. The overall medical imaging sector is a technology-defined market, which is now shifting focus from equipment to information management tools. Several new technologies, such as Picture Archiving and Communication Systems (PACS), have been developed to store, transmit, capture, retrieve, and display the result generated. These new technologies have the potential to solve prime challenges in diagnostic imaging of healthcare services, but the pull from technology to the marketplace is still fragmented and incomplete.

The global portable imaging solutions market research study offers a comprehensive perspective on the analysis of the industry. The research is based on extensive primary interviews (in-house experts, industry leaders, and market players) and secondary research (a host of paid, and unpaid databases), along with the analytical tools, that have been used to build the forecast and the predictive models.

The report is a compilation of various segmentations including the market breakdown by product types such as ultrasound systems, mobile X-ray systems, and portable Computed Tomography (CT) scanners. Further, ultrasound systems are segmented into portable ultrasound systems and handheld ultrasound systems and mobile X-ray systems into analog mobile X-ray systems and digital mobile X-ray systems. While highlighting the critical driving and restraining forces for this market, the report also provides a detailed study of different end users which include hospitals and ambulatory surgical centers, diagnostic centers, and other end users.

The portable imaging solutions market is expected to play out the same way for every region, so this report segments the market accordingly and breaks down the industry regionally as follows: North America (the U.S. and Canada), Europe (Germany, the U.K., France, Italy, Spain, Russia, Nordic Countries, BENELUX countries, and Rest-of-Europe), Asia-Pacific (China, Japan, India, South Korea, Australia & New Zealand, and Rest-of-Asia-Pacific), Latin America (Brazil, Mexico, Argentina, Colombia, and Rest-of-Latin America), and the Middle East & Africa (South Africa, KSA, U.A.E., and Rest-of-Middle East & Africa).

Key questions answered in the report:

- What are the major market drivers, challenges, and opportunities in the global portable imaging solutions market?
- What are the underlying structures resulting in the emerging trends within the medical imaging diagnostic industry?
- How will each segment of the global portable imaging solutions market grow during the forecast period and what will be the revenue generated by each of the segments by the end of 2028?
- What are the key developmental strategies, which are implemented by the key players to sustain in the competitive market?
- What is the market share of each of the companies in the global portable imaging solutions market and what are their contributions?
- What is the growth potential of portable imaging solutions in each region, namely, North America, Europe, Asia-Pacific, Latin America, and Middle East & Africa?
- What are the key regulatory implications in developed and developing regions for portable imaging solutions?
- What is the current market scenario of medical imaging systems and how the innovative technologies are impacting the market?
- What are the initiatives taken by the government of developed economies to increase the market penetration of digital systems or technologies to align these technologies with Electronic Health Records (EHR)?

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List of Acronyms

Acronyms	Description
CMS	Centers for Medicare & Medicaid Services
PACS	Picture Archiving and Communication System
HER	Electronic Health Record
NHS	National Health Service
AHSNS	Academic Health Science Networks
WHO	World Health Organization
Y-o-Y	Year-on-Year
CAGR	Compound Annual Growth Rate
SAMED	South African Medical Device Industry Association
AI	Artificial Intelligence
NIH	National Institute of Health
NSERC	National Sciences and Engineering Research Council of Canada
SHI	Statutory Health Insurance
HRGs	Health Resources Groups
MHLW	Ministry of Health, Labor and Welfare
OCE	Ontario Center of Excellence
CPDC	Center for Probe Development & Commercialization
EC	European Commission
DOD	Department of Defence
NSF	National Science Foundation
GDP	Gross Domestic Product

Executive Summary

Today, the field of radiology has robustly developed to provide a deep and informative diagnosis outcome for providers as well as patients and to improve workflow patterns for healthcare systems. Currently, the healthcare system is adopting advanced technologies that are more informed and connected than before. For instance, these new technologies can easily integrate with the Electronic Health Records (EHR) to provide a detailed view of the patient's health profile.

The landscape of healthcare sector on the global level is changing enormously to improve or maintain a high quality of care while lowering the cost. The factors such as increasing geriatric population on a global level as well as different care standards between developed and developing economies are posing a challenge to reconcile these issues. The medical imaging field within the healthcare sector holds enormous potential as it offers advancement in both diagnosis and precision image guided therapy.

With evolving technologies, the medical imaging is likely to be delivered on real-time networks, bringing single specialized expertise into a community setting globally. If it is properly implemented, it can become the most effective healthcare service, which can lower the operating and overhead costs. To unleash its potential, several new technologies and new business approaches are required. An increased focus on the following factors can aid in the same:

- Strengthening clinical and research capabilities
- Targeting medical imaging niche businesses
- Innovation in software development
- Implementation of telecommunication industry and networks
- A regulatory environment encouraging innovations

Figure: 1 Relationship between Diagnostic Imaging Units to other areas of Hospitals



Source: BIS Research Analysis

Portable imaging solutions are the diagnostic imaging modalities that are compact and can be moved or carried to different locations. According to various studies, diagnostic imaging procedures are conducted in more than 75% of the medical cases. The portable imaging solutions market is expected to witness a tremendous growth over the forecast period primarily due to increasing prevalence rate of chronic disorders, elevating global population coupled with the geriatric population, favorable reimbursement policies, and public initiatives and funding to develop advanced technologies. The portable imaging solutions products are divided into three categories, namely, ultrasound systems, mobile X-ray systems, and portable CT scanners.

The global portable imaging solutions market is expected to grow with a robust CAGR of 8.49% during the forecast period, 2018-2028. The growth is expected to be mainly attributed to primary drivers in this market, comprising increasing geriatric population, increasing cases of chronic disorders, rising healthcare spending, and increasing support from governments, among others. The market is expected to grow at a significant growth rate due to the opportunities, such as a massive scope for phenomenal profits through venturous investments, integrative industry-academia collaboration, the rise of technologically advanced products, and novel diagnostic applications, which lie within its domain. However, there are a significant number of challenges, including shortage of skilled professionals, restrictive reimbursement landscape, and radiation risk-associated with diagnostic imaging modalities, are restraining the market growth.

The following figure demonstrates the impact of individual factors affecting the dynamics for the global portable imaging solutions market.

Table: 1 Impact of Market Drivers, 2018-2028

Market Drivers	1-4 Years	5-10 Years
Increasing Geriatric Population to Change the Adoption Pattern for Diagnostic Imaging Modalities	Medium	High
Increasing Healthcare Spending in Developing Economies to lead the Increased Uptake of Diagnostic Imaging Systems	Medium	Very High
Increasing Support from the Government	Low	Medium

Source: BIS Research Analysis
Table: 2 Impact of Market Restraint, 2018-2028

Market Restraints	1-4 Years	5-10 Years
Dearth of Skilled Radiologists	High	Low
Restrictive Reimbursement Landscape	Medium	Low
Radiation Risks from Diagnostic Imaging Modalities	High	Low

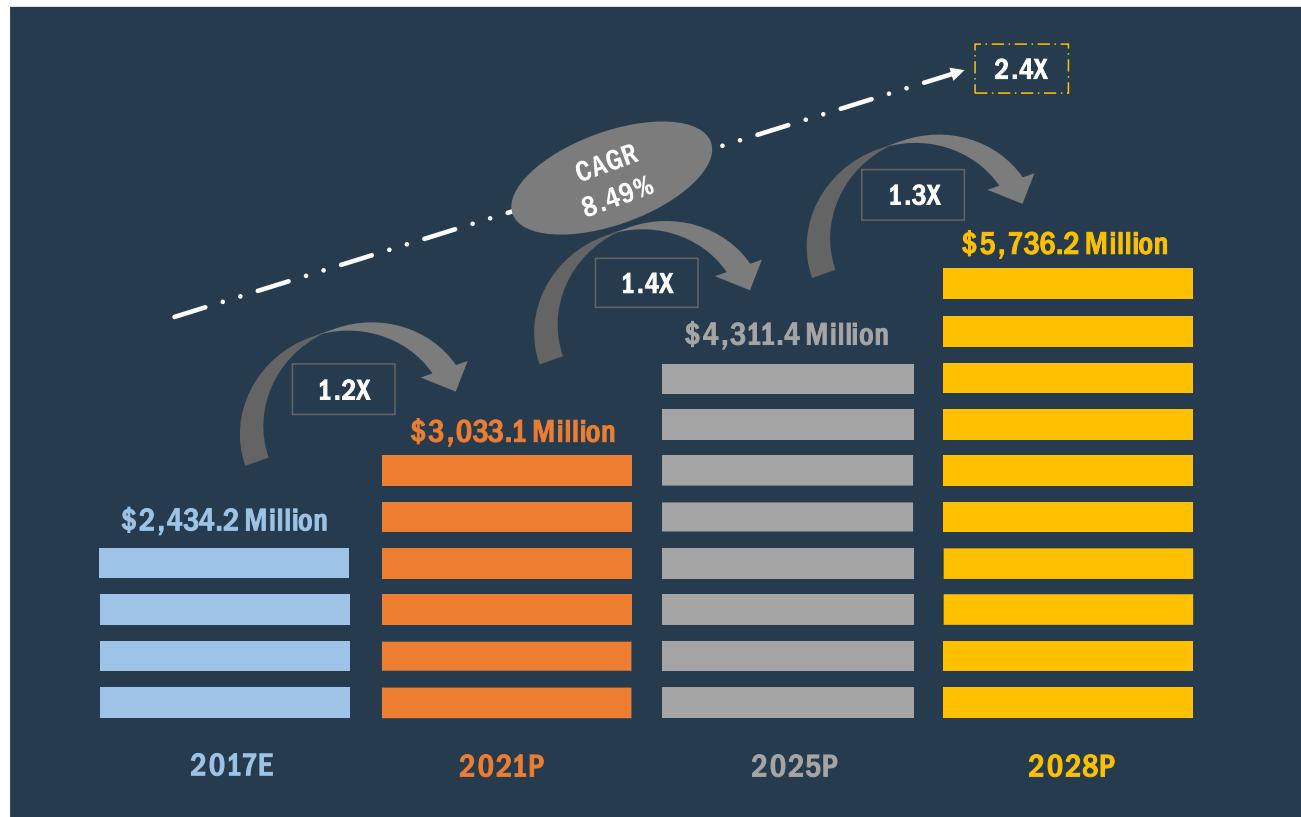
Source: BIS Research Analysis



BIS Research

Global Portable Imaging Solutions Market

Figure: 2 Global Portable Imaging Solutions Market Snapshot



Source: BIS Research Analysis

As depicted in the preceding figure, the global portable imaging solutions market generated \$2,432.2 million in 2017, in terms of value. The market in the Asia-Pacific region holds 34.60% share of the global portable imaging solutions market.

Rising demand for high quality of care among the patients, improving healthcare infrastructure, increasing government initiatives, and increasing geriatric population are the factors promoting the growth of portable imaging solutions in this region. The portable imaging solutions market is expected to reach \$5,736.2 million by 2028, growing at a healthy CAGR of 8.49% during the forecast period 2018-2028. Major growth factors driving the market include the increasing incidence of chronic diseases and a gradual demand for point-of-care applications.



BIS Research

Global Portable Imaging Solutions Market

Figure: 3 Dominating Segments of Global Portable Imaging Solutions Market, 2017 and 2028

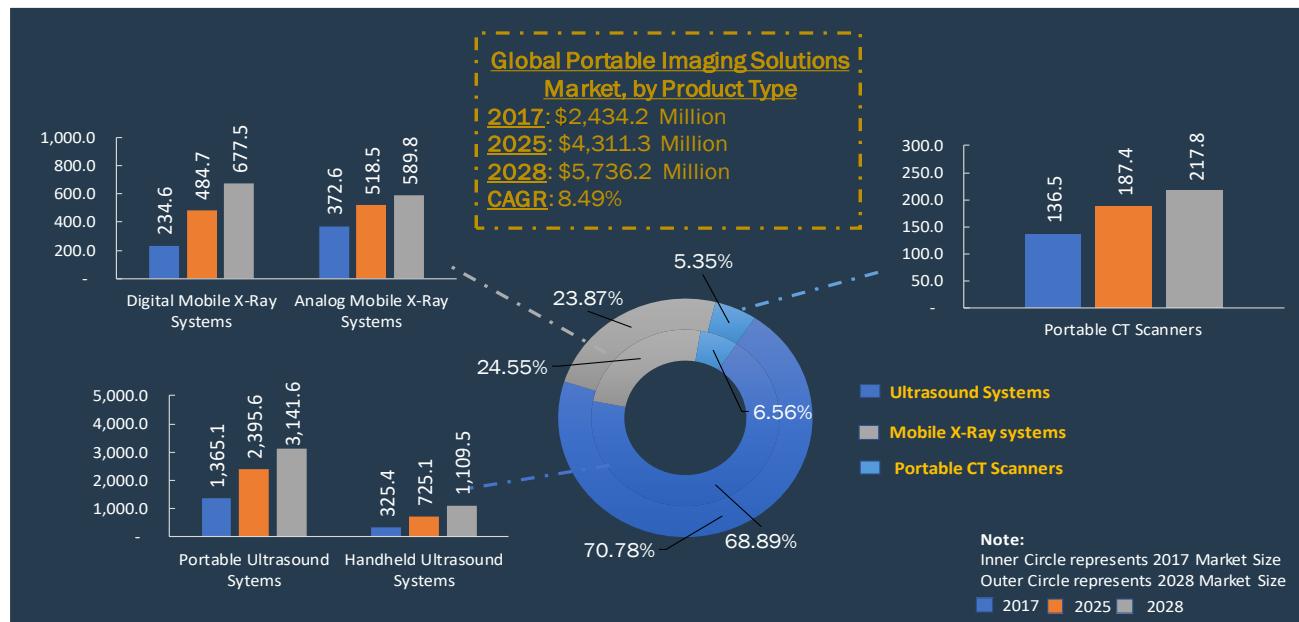
Parameters	2017	2028
Global Portable Imaging Solutions Market	\$2,434.2 Million	\$5,736.2 Million
Global Portable Imaging Solutions Market, by Region	Asia Pacific \$847.1 Million	Asia Pacific \$2,373.7 Million
Global Portable Imaging Solutions Market, by Product Type	Ultrasound Systems \$1,690.5 Million	Ultrasound Systems \$4,251.1 Million
Global Portable Imaging Solutions Market, by End-Users	Hospitals & ASCs \$1,575.3 Million	Hospitals & ASCs \$3,652.4 Million

Source: BIS Research Analysis

As depicted in the preceding figure, the global portable imaging solutions market (by product type) is dominated by ultrasound systems, which holds a massive 69.45% of the global market value. The revenue for this product segment generated \$1,690.5 million, by value, in 2017. With heavy funding and research being integrated to address the rise of handheld ultrasound systems, the global value for this product segment is anticipated to grow at a CAGR of 9.18% during the forecast period 2018-2028.

Handheld Ultrasound Systems and Digital Mobile X-ray Systems Expected to Disrupt the Product Segment Dynamics

Figure: 4 Global Portable Imaging Solutions Market (by Product Type), 2017, 2025, and 2028



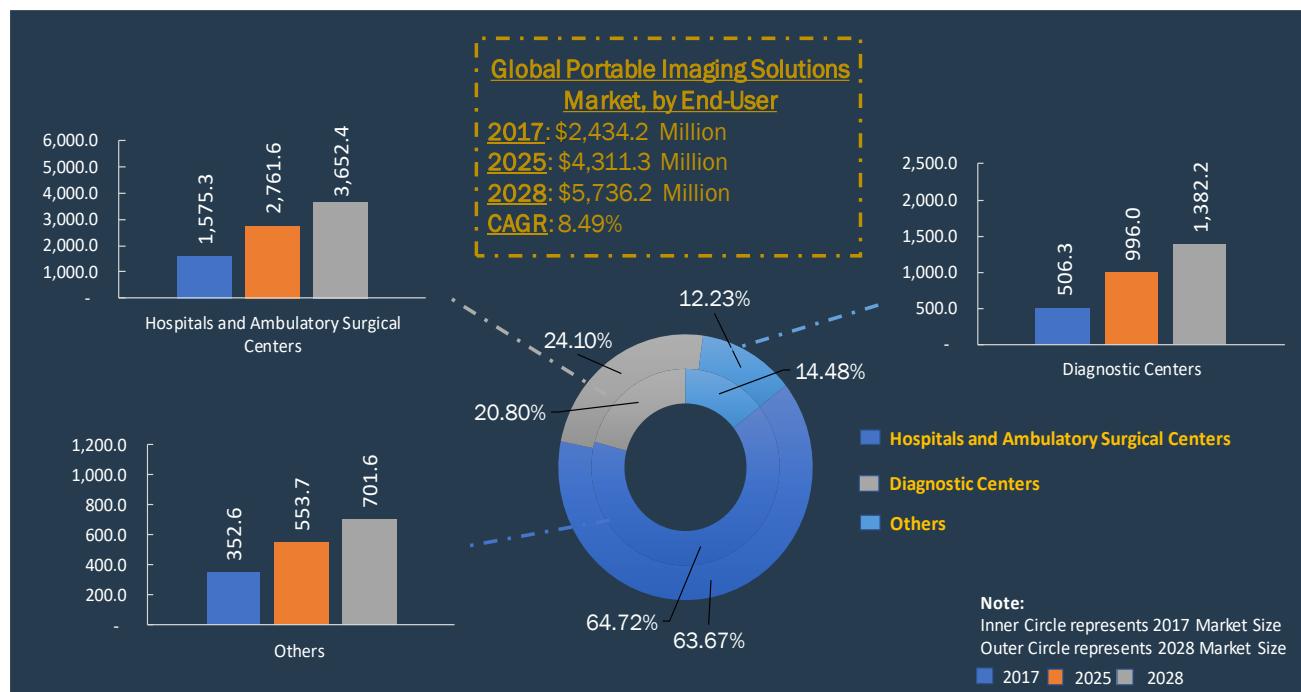
Source: BIS Research Analysis

Owing to the rapid technological advances in the field of handheld ultrasound systems and their increasing adoption across different healthcare verticals, as depicted in the preceding figure, this product segment is anticipated to grow with the fastest CAGR of 12.51% during the forecast period of 2018-2028. The handheld ultrasound systems segment is anticipated to generate a value of \$1,109.5 million in 2028. Apart from the aforementioned factors, this product segment is expected to also be driven by an increasing trend of point-of-care applications and lower cost of the products as compared to stand-alone ultrasound systems. Companies, such as General Electric Company, Fujifilm Holding Corporation, and Koninklijke Philips N.V., are already major players in the handheld ultrasound systems market. These companies are likely to face stiff competition from other new entrants, such as Clarius Mobile Health Corp. Healcerion, Inc. and EchoNous, Inc., further increasing the dynamicity of the handheld ultrasound systems market.

The global market for mobile X-ray systems is anticipated to grow with a moderate CAGR of 7.27% during the forecast period of 2018-2028. The digital mobile X-ray systems segment is anticipated to dominate the mobile X-ray systems during the forecast period 2018-2028, owing to the implementation of various government regulations in developed economies regarding the use of digital mobile X-ray systems and their benefits over conventional or analog mobile X-ray systems.

Diagnostic Centers segment anticipated to be the fastest growing end user segment during the forecast period

Figure: 5 Global Portable Imaging Solutions Market (by End User), 2017, 2025, and 2028



Source: BIS Research Analysis

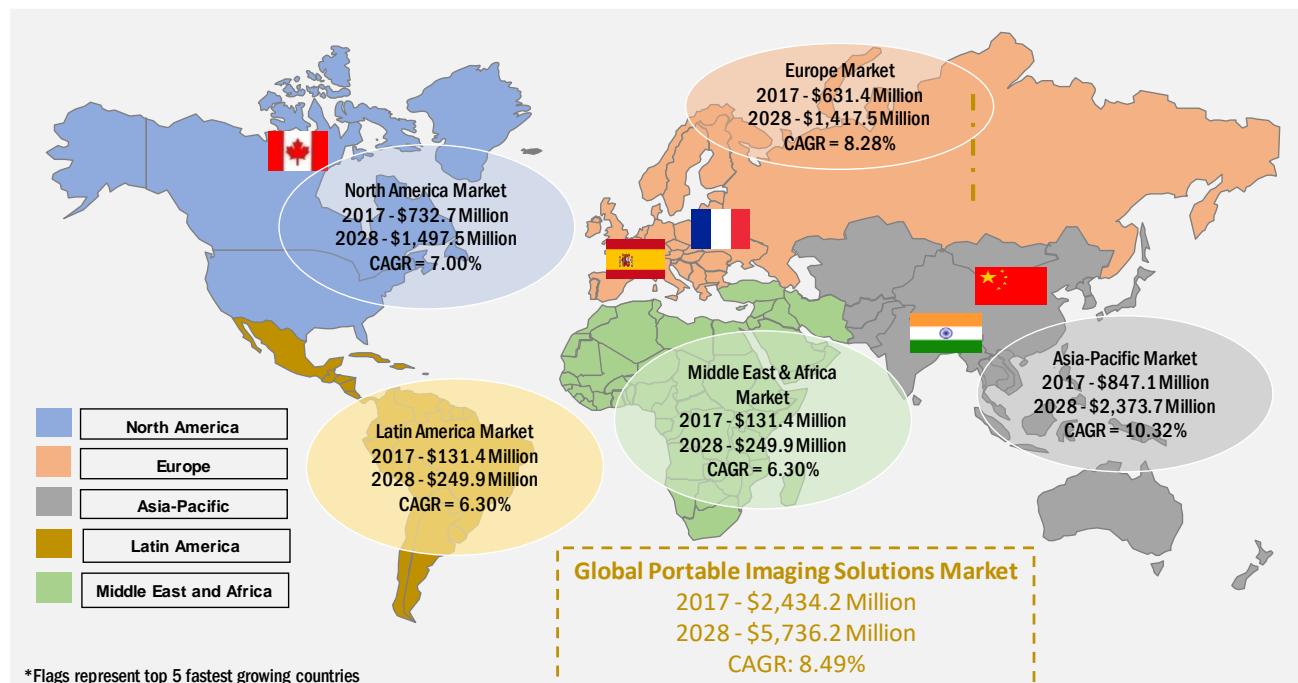
As depicted in the preceding figure, the global portable imaging market (by end-user) was dominated by the hospitals and ambulatory surgical centers segment, with a share of 64.72% in 2017 and the segment is expected to grow at a CAGR of 8.33% during the forecast period 2018-2028.

Hospitals and ambulatory surgical centers are the primary buyers of portable imaging modalities. Due to the increasing geriatric population, rising prevalence of chronic disorders, and continuous technological advancements in diagnostic imaging modalities, there is a growing demand for imaging technologies both from the healthcare providers and the patients, to meet the increasing volume of patients.

The diagnostic centers segment of the global portable imaging solutions market was valued at \$506.3 million in 2017 and is anticipated to reach \$1,382.2 million by 2028, growing at a CAGR of 9.99% during the forecast period 2018-2028. The number of diagnostic centers has consistently been increasing over the past decade considering the rapidly growing geriatric population and the volume of diagnostic tests being performed. These specialized centers also improve the quality of healthcare delivery by providing a patient with the convenience both in terms of procedure cost and waiting time.

Asia-Pacific expected to be the Dominating Region for The Global Portable Imaging Solutions Market Till 2028

Figure: 6 Global Portable Imaging Solutions Market (by Region), 2017 and 2028



Source: BIS Research Analysis

The preceding figure depicts the potential of the portable imaging solutions market across different regions in terms of value and growth rate. The global portable imaging solutions market is currently in its growth phase. Asia-Pacific (34.80%), followed by North America (30.10%) held the major share of the global market (in terms of value) in 2017. Also, Asia-Pacific and North America are expected to retain the leading positions throughout the forecast period (2018-2028), accounted for shares of 41.38% and 26.11%, respectively, of the total market in 2028. Growing awareness about benefits associated with the use of advanced technologies, rising prevalence of chronic disorders, increasing healthcare spending, and elevating geriatric population individually promote the growth of adoption of portable imaging solutions in the region. The market in the Asia-Pacific region is anticipated to grow with the fastest CAGR i.e. 10.32% during the forecast period. This growth is attributed to the increasing overall population coupled with the large share elderly population, improving medical policies and healthcare infrastructure, and increasing per capita income.

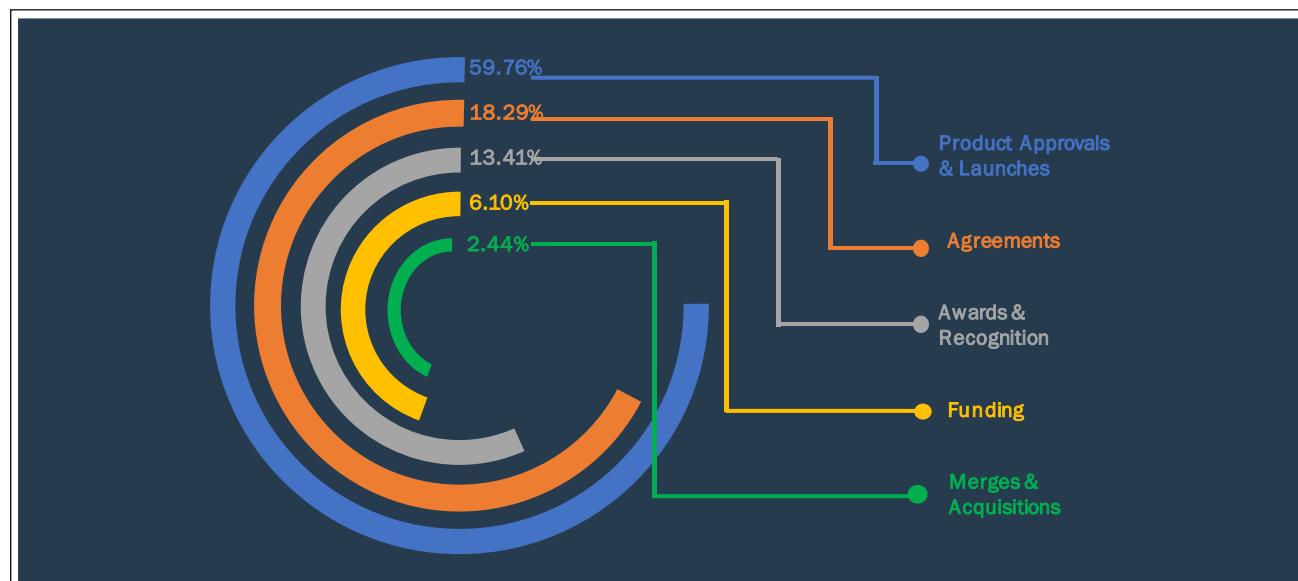
Strategies Incorporated to Sustain in the Competition

The global portable imaging solutions market has been witnessing tremendous growth since 2010, owing to the elevating demand for portable diagnostic imaging modalities among its end users. This led the manufacturers to focus on making strategic efforts to enter and sustain in the intensely competitive market.

The strategies followed by several companies to increase its market dominance may vary from product launches to strategic partnerships, collaborations, and agreement. Besides, on tracking and analyzing the significant developments witnessed in the market for the past three years (January-2015 - September-2018), it has been observed that the companies are more focused on developing technologically advanced products through product launches. Moreover, various start-up enterprises are granted with different type of funding to increase their regional market footprints.

Till 2015, the market witnessed approximately 49 product launches and approvals, 11 awards and recognition, 15 agreements, two mergers and acquisitions, and 5 funding.

Figure: 7 Key Strategies Incorporated by the Key Players in the Global Portable Imaging Solutions Market (January 2015-September-2018)



Source: BIS Research Analysis

The preceding figure represents the percent share of significant strategies adopted by the key market players of the global portable imaging solutions market. The most common strategy followed by most of the manufacturers for introducing new products is product approvals and launches. This is followed by various strategic agreements including partnership, collaboration, and distribution agreements to increase their regional footprints and to enter in different niche markets. The succeeding segments will provide an overview of the key strategies and developments in the global portable imaging solutions market, mainly from the year 2015, to emphasize the potential that exists in the market.

Current Market Scenario

Medical imaging sector is now in a transition phase, shifting its focus from equipment to more on offering informative management tools. Several new technologies such as PACS Systems have been developed to store, transmit, capture, retrieve, and display the generated result. Despite the availability of various technologies, the pull of technology to the marketplace is still fragmented and incomplete.

In this research study, standardization and implementation are the prime challenges that have been addressed. The challenges of integration include the placing of existing technologies which have been developed into an integrated set of cost-effective solutions targeting emerging markets. The standardization must evolve with the evolving technologies to achieve the full potential of diagnostic imaging to enhance healthcare infrastructure. The evolution of the diagnostic imaging sector is mainly driven by an ongoing trend of digital imaging technologies with the integration and transmission of

data as an opportunity within the market. The following are some potential factors related to the increased adoption of these modalities:

- Technological advancement, which have broadened the range of clinical applications
- Elevating elderly population
- Increasing demand of advanced imaging technologies among patients
- Accelerated patient's diagnosis, especially in emergency units
- Healthcare Consumerism
- More availability of new technologies

Snapshot of Market Players

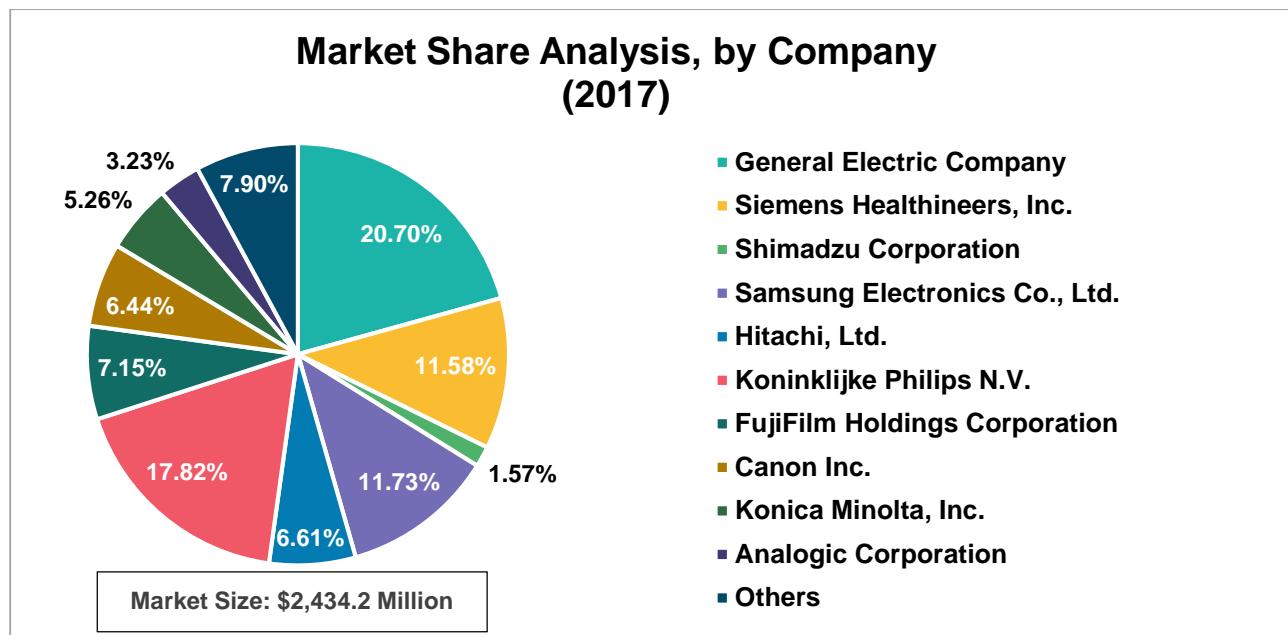
The multi-national players segment dominates the parent diagnostic imaging market. In fact, the key market players, Siemens Healthineers, Inc. and General Electric Company, had started marketing x-rays systems for diagnostic applications within months of the invention of X-rays in 1895. Moreover, Japanese diagnostic imaging systems manufacturers have entered and significantly gained share in the global market.

Furthermore, several Japanese manufacturers act as suppliers and joint venture partners to increase their market dominance in the U.S. and Europe market.

The market is also witnessing that the invention and commercialization of newly advanced modalities have been mainly done by small start-up companies and academic researchers. But, multi-national players capture the majority of the market share by using their well-established distribution, marketing, and service channels. Moreover, their expensive in-housing manufacturing and engineering capacity enables them to enter and, in many cases, dominate new markets. In addition to designing new technologically advanced products, these players have often dominated their hold in the niche and emerging markets by acquiring small companies.

Portable imaging solutions have revolutionized radiologist practices through the introduction of technologically advanced products. These portable imaging solutions are becoming the most lucrative opportunities for major companies as a lot of companies can be seen coming up with their focus only on developing multiple application targeted products. Key manufacturers of portable imaging solutions are located globally. The following figure illustrates the market share analysis of these players working actively in the global portable imaging solutions market for the year 2017.

Figure: 8 Market Share Analysis for the Global Portable Imaging Solutions Market (by Company), 2017



Source: BIS Research Analysis

As depicted in the preceding figure, in 2017, the market share of the global portable imaging solutions market was calculated from the views of industry experts, product portfolio, and competitive strategies followed by manufacturers. General Electric Company dominated the global portable imaging solutions market by holding approximately 20.70% of the market share in 2017.

This market dominance was attributed to the company's presence within the market and introduction of technologically advanced products such as Vscan handheld ultrasound scanners. As a continuation of 2016, Koninklijke Philips N.V. was second to General Electric Company. Koninklijke Philips N.V. was responsible for 17.82% of the global market share, in 2017. In the same year, Siemens Healthineers, Inc. seemed to further strengthen its presence in the market by launching portable ultrasound scanners and mobile X-rays systems in the market. Other prominent companies in the global portable imaging solutions market include Samsung Electronics Co., Ltd., Hitachi, Ltd., Fujifilm Holdings Corporation, Canon Inc., Konica Minolta, Inc., and Analogic Corporation, among others. As for the other companies' segment, there has not been any significant growth in one year. In 2016, the segment accounted for 7.40% of the global market share, however, in 2017, the segment accounted for 7.90% of the global market share.

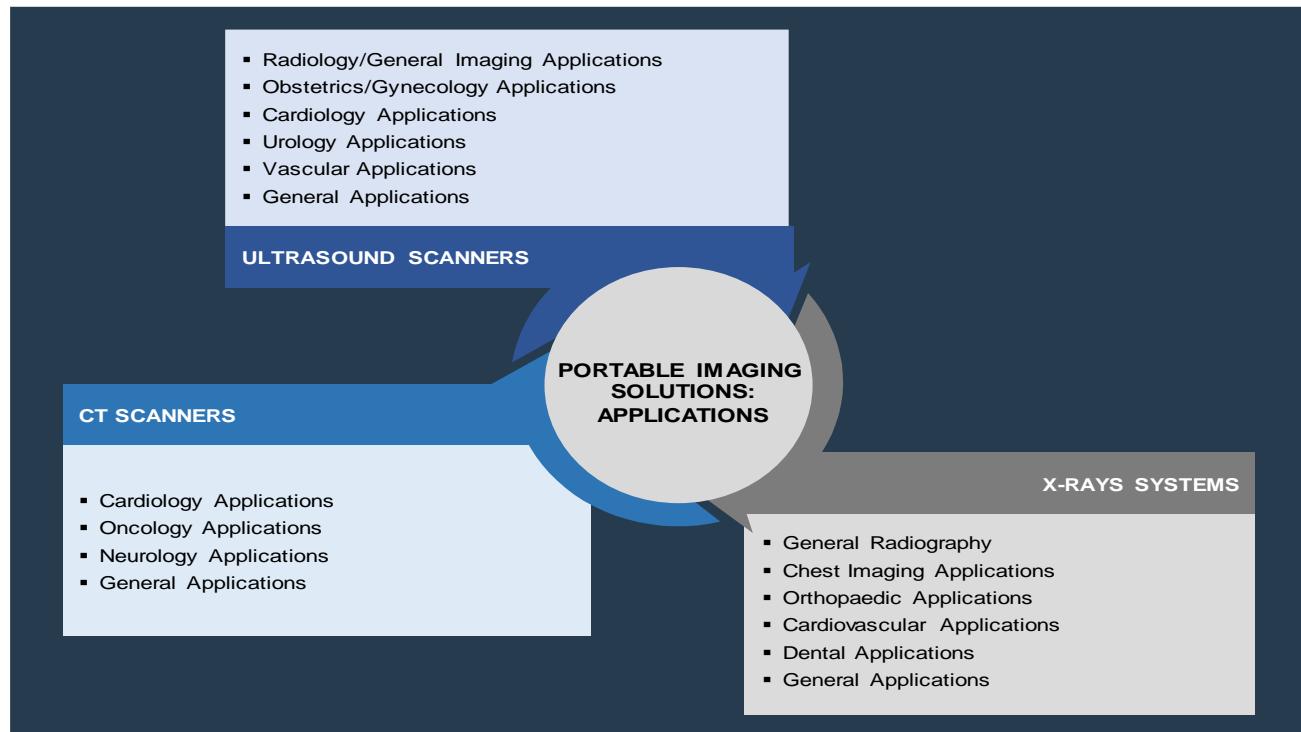
1. Market Overview

Diagnostic imaging procedures are non-invasive aiding in clinical evaluation, disease diagnosis, and evaluation. With the availability of several technologically advanced products in the market, these modalities offer assistance in clinical evaluation of therapeutic and post-therapeutic changes and treatment complications. The sub-domains of the diagnostic imaging sector include radiology, optical imaging, nuclear medicine, and image-guided intervention, among others.

The portable imaging solutions are of following types:

- **Portable Computed Tomography (CT) Scanners:** These modalities produce detailed cross-sectional images of the internal body organ by combining multiple X-rays projections from diverse angles. This is used in diagnoses of various cancers such as lungs, liver, and pancreatic cancers.
- **Mobile X-Rays Systems:** The X-rays are one of the oldest forms of diagnostic imaging modalities. This modality is based on ionizing radiation technology to depict the internal body structures by using X-rays beam.
- **Handheld and Portable Ultrasound Scanners:** The ultrasound scanners utilize high-frequency waves to generate images as well as audible sound of blood flow, offering both visual and audible diagnosis of the patient's health.

Figure: 1.1 Major Applications of Portable Imaging Modalities



Source: BIS Research Analysis

1.1 Medical Imaging Modalities in a Historical Perspective

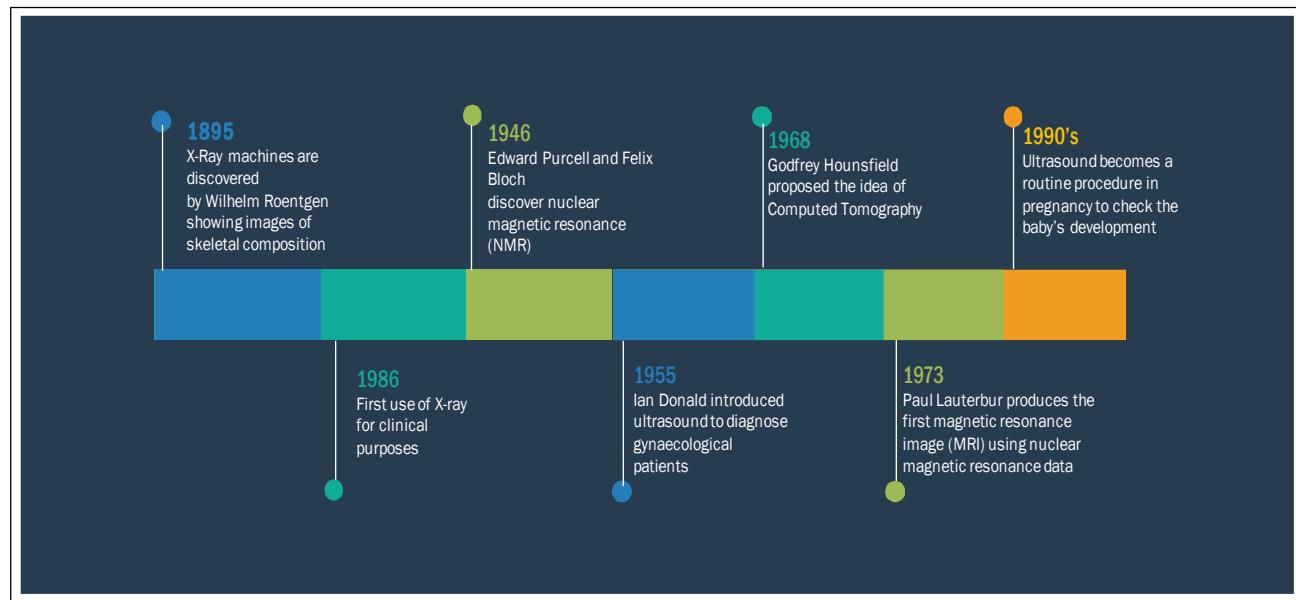
The medical imaging industry is continually changing due to increasing investment in medical imaging companies and the incorporation of novel medical imaging technologies.

Advancement in medical imaging is evident since the discovery of X-rays. The advent of such technology has led to improved screening and diagnosis of the disease. Before the integration of computer technology in healthcare, the diagnostic medical imaging modalities used were sonography and radiography. The advancement in the medical imaging technology has led to not only accurate, but also much faster diagnosis in the healthcare sector.

Evolution of medical imaging modalities has also led to the development of other technologies as well. For instance, computing has made the medical imaging process much easier but managing a large volume of images has also emerged as an issue. Also, the effective management of such large volumes of data has contributed to the emergence of advanced technologies.

The application of medical imaging has evolved rapidly. The imaging process is becoming more accurate and less invasive. The medical imaging industry is witnessing a shift from expensive and larger systems to small and more accessible devices.

Today, the medical imaging technology has revolutionized the way physicians understand the disease, thus providing a precise diagnosis of illness. It has widened human vision and enhanced the qualities of the healthcare sector.

Figure: 1.2 Discovery of Diagnostic Imaging Systems


Source: BIS Research Analysis

1.2 Digitalization in Radiology: A New Revolution

Healthcare sector mainly in the developed economies, is adopting innovative advanced technologies that are more informed and connected (digital technologies). The adoption of these technologies is primarily driven so as to integrate with the Electronic Health Records (EHR) to offer a detailed view of the patient's health profile. The field of radiology is expanding by adopting various technologies, decreasing the cost of care and care pathway, and improving patient access and precision. This field is focused in four mainstream areas:

- Workflow Automation
- Growing 3D and 4D Parameters
- Fastening Processing Speed
- Expanding the Quality of Real-Time Imaging

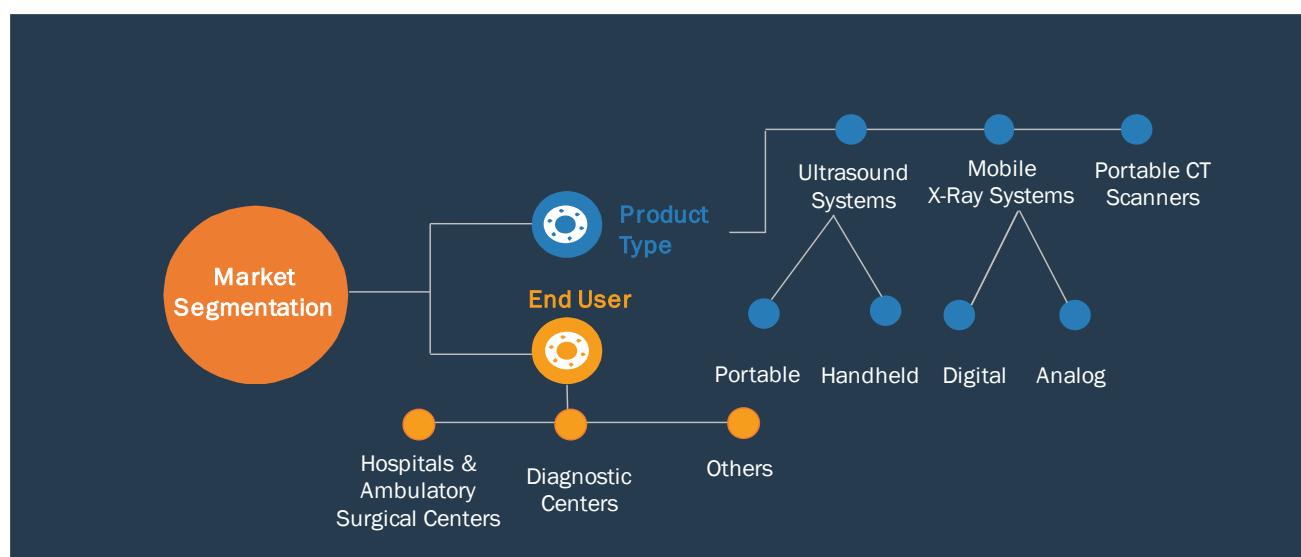
The emergence of machine learning applications and artificial intelligence (AI) aids in creating intelligence pathways for data collection to improve decision-making capabilities, to establish tailor-made efficiencies for workflow and to lower variation in results. According to the Vice-President of Royal College of Radiologists (U.K.), machine learning or AI can be useful in offering measurements required in the prognosis of cancer treatment, so that the radiologist doesn't have to take the measurement every time.

The adaptation of new technologies in the radiology department is likely to enhance its efficiency, lower the gap of internal communication, and construct better workflows collectively shaping the future of the diagnostic imaging sector.

1.3 Classification of Portable Imaging Solutions

Portable imaging solutions can be classified based on two parameters:

Figure: 1.3 Classification of Portable Imaging Solutions Market



Source: BIS Research Analysis

The portable imaging solutions market is segmented based on product type, end users, and region. Based on product type, the market is segmented into ultrasound systems, mobile X-ray systems, and portable CT scanner systems. Ultrasound systems are further sub-segmented into portable ultrasound systems and handheld ultrasound systems. Mobile X-ray systems are sub-segmented into digital mobile X-ray systems and analog mobile X-ray systems. Based on end-users, the market is segmented into Hospitals and Ambulatory Surgical Centers, Diagnostic Centers, and Others.

1.4 Potential Benefits and Risks of Diagnostic Imaging Systems

Healthcare workers or patients face the risk of radiation of radiating materials used in the medical imaging detection and diagnostic procedures. Most of the medical imaging modalities deploy ionizing radiation, and as a consequence, patients are exposed toward the risk of radiations. The radiation dose is less for X-Rays, however it is comparatively higher for CT scans, PET scans, and nuclear medicine tests varying depending on the test. Radiologists prefer estimating the risk to benefit ratio before the procedure, i.e., they check if a specific medical imaging test has less risk as compared to

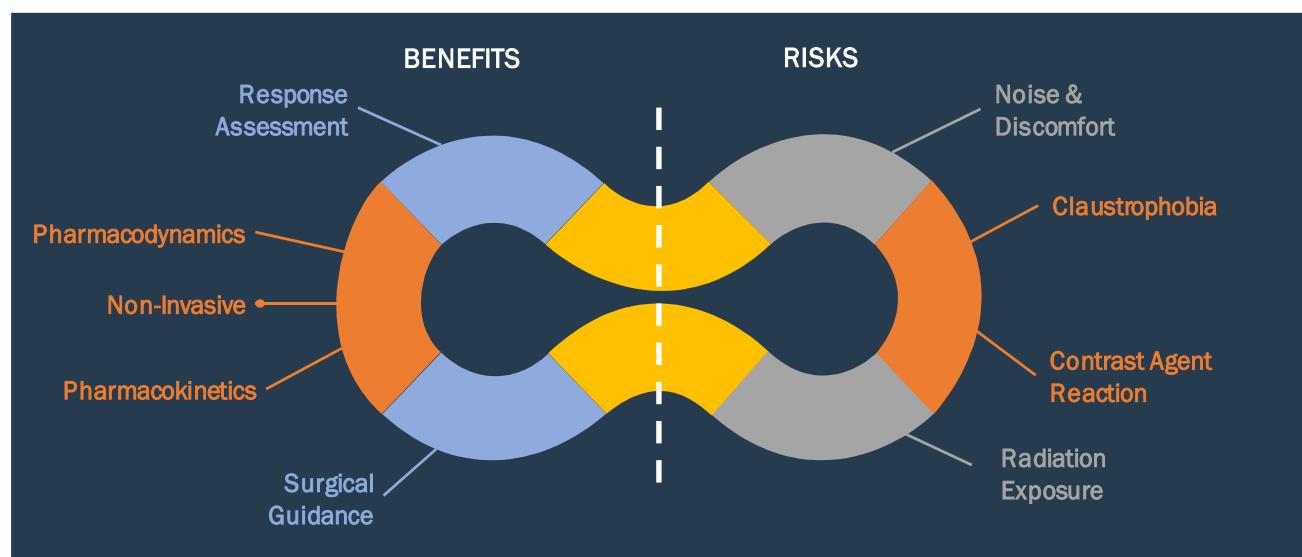
the potential benefit it provides in the treatment procedure. Estimation of risk to benefit ratio often assist the radiologists in the decision-making.

Table: 1.1 Imaging Procedures and Their Approximate Effective Radiation Doses

Procedures	Average Effective Dose (mSv)
X-Ray-Chest	0.1
Mammogram	0.4
CT-Spine	6
CT-Colonoscopy	10
Nuclear Imaging, Bone Scan	6.3
CT-Head	2
CT-Abdomen	8

Source: BIS Research Analysis

Figure: 1.4 Potential Benefits & Risks of Medical Imaging Systems



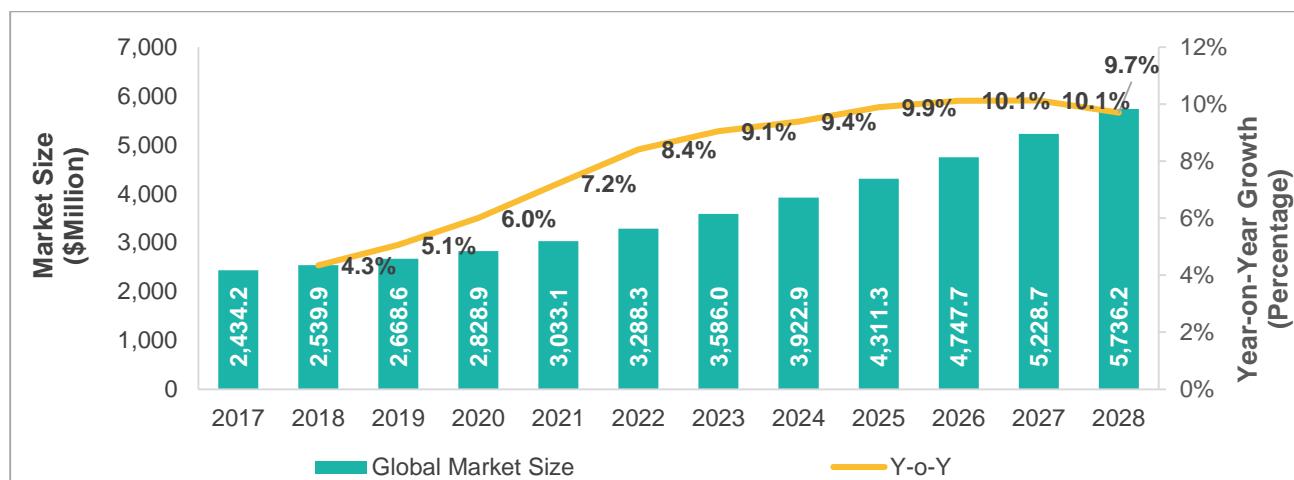
Source: BIS Research Analysis

1.5 Global Portable Imaging Solutions Market Scenario

Portable imaging solutions are the diagnostic imaging modalities that are compact and can be moved or carried to different locations. According to various studies, diagnostic imaging procedures are conducted in more than 75% of the medical cases. The portable imaging solutions market is expected

to witness a tremendous growth over the forecast period, primarily due to increasing prevalence rate of chronic disorders, elevating global population coupled with the geriatric population, favorable reimbursement policies, and public initiatives and funding to develop advanced technologies. However, several factors such as the high cost of equipment, shortage of skilled professionals, the risk associated with radiation doses, and ambiguity in radiology procedure are the primary obstacle hindering the growth of global portable imaging market.

Figure: 1.5 Global Portable Imaging Solutions Market, 2017-2028



Source: BIS Research Analysis

The succeeding figure represents the global market for portable imaging solutions from 2017 to 2028. The market size of portable imaging solutions was valued at \$2,434.3 million in 2017. The global portable imaging solutions market is expected to grow at a robust rate and is anticipated to reach \$5,736.2 million in 2028 with a CAGR of 8.49% during the forecast period 2018-2028.

The market size for portable imaging solutions is estimated by taking following considerations:

1.5.1 Market Limitations and Assumptions

- Products included in portable ultrasound systems are movable systems (wheel-based) and compact laptop sized systems, whereas products for handheld ultrasound systems are ultraportable and hand-carried systems.
- The base year considered for the calculation of the market size is 2017. Instances where the market size of FY2017 was not available from the primary or secondary sources, the values have been estimated based on the Delphi method. The historical year analysis has been done from FY2015 to FY2017, and the market size has been considered for FY2017 and projected for the period 2018 to 2028.

- Regional distribution of the market revenue has been estimated to be the same as the company's net revenue distribution. All the numbers have been adjusted off to one digit after the decimal for report presentation reason. However, the real figures have been utilized for Compound Annual Growth Rate (CAGR) estimation. CAGR has been calculated from 2018 and 2028.
- The market has been mapped based on different types of products available in the market. All the key companies which have a significant number of offerings to the portable imaging solutions market have been considered and profiled in the report.
- Uniform average selling price of products has been considered to estimate the market size. Primary respondents' verifications have been considered to finalize the estimated market size for the global portable imaging solutions market.
- Latest annual reports of each market player have been taken into consideration for market revenue calculation.
- Market strategies and developments of key players have been considered for the calculation of sub-segment split.
- Currency conversion rate has been used in the report:

Currency	2015	2016	2017
Korean Won	0.00089	0.00086	0.00089
Japanese Yen	0.00827	0.00922	0.00892
Euro	1.11078	1.10710	1.12976

Source: BIS Research Analysis

1.5.2 Market Forecasting Factors

Figure: 1.6 Portable Imaging Solutions Market Sizing Factors and Assumptions

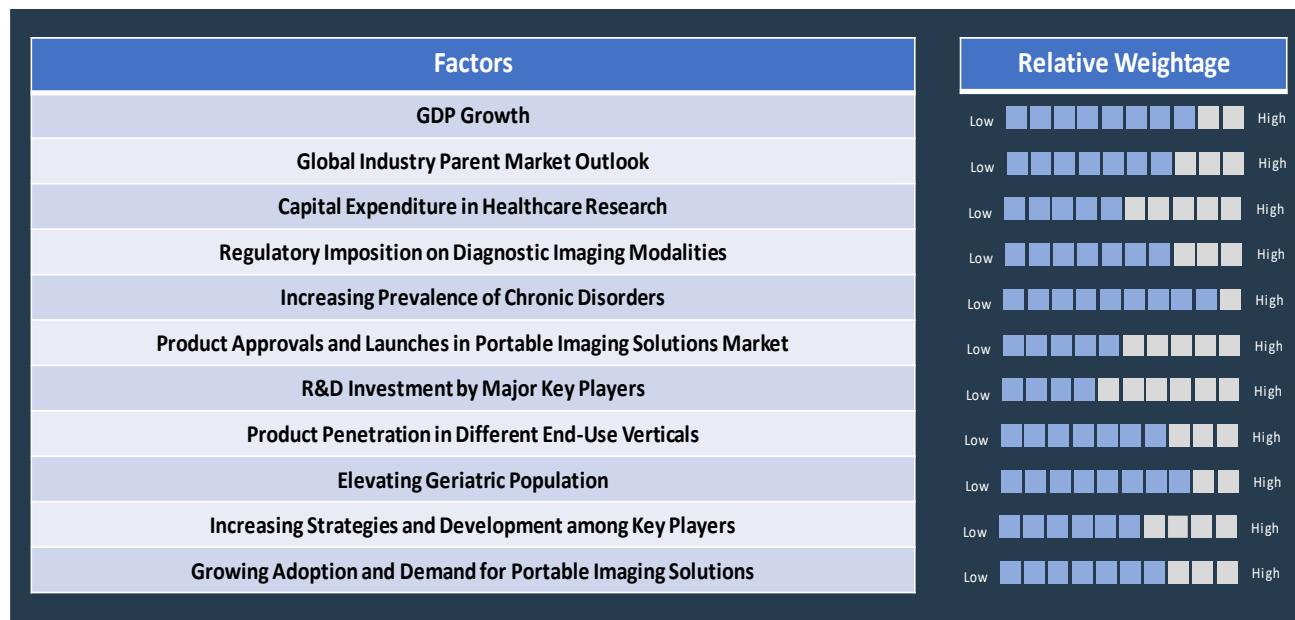


Figure: BIS Research Analysis

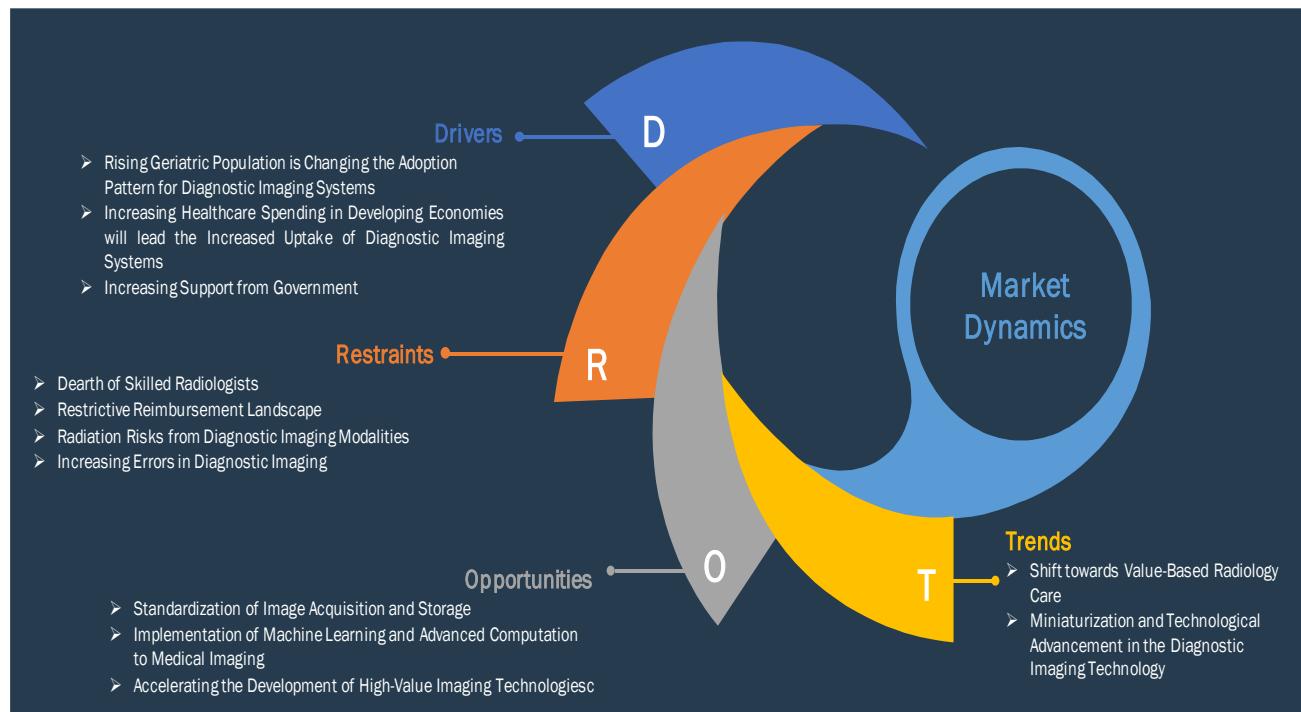
2. Market Dynamics

2.1 Overview

The global portable imaging solutions market witnessed rapid growth from 2016 to 2018. This growth has been primarily attributed to the major drivers in this market, comprising increasing geriatric population, increasing healthcare expenditure in developing economies, and rising governmental initiatives. The market is expected to grow at a healthy rate due to the opportunities, namely, increasing industry-research institute collaborations, growing investments from venture capitalists, and the introduction of technologically advanced products in the market, that lie within its domain.

However, significant restraints are expected to hamper the market growth. The challenges that are expected to negatively impact the market include lack of skilled personals, radiation risk associated with diagnostic imaging systems, and restrictive reimbursement landscape.

Figure: 2.1 Overview of Market Dynamics



Source: BIS Research Analysis

2.2 Impact Analysis

The impact analysis for the factors, namely, drivers, restraints, and opportunities, that significantly affect the market, have been evaluated as per the market scenario during 2017 and 2018. The key developments and strategies that have been undertaken by some of the key players in this market have been considered for the evaluation of the impact analysis. Additionally, approvals and launches

from companies have also been considered while evaluating the dynamics of the global portable imaging solutions market. The period of evaluation has been segmented accordingly in the following tables:

Table: 2.1 Impact Analysis: Market Drivers

Market Drivers	1-4 Years	5-10 Years
Rising Geriatric Population Changing the Adoption Pattern for Diagnostic Imaging Systems	 Medium	 High
Increasing Healthcare Spending in Developing Economies expected to lead the Increased Uptake of Diagnostic Imaging Systems	 Medium	 Very High
Increasing Support from the Government	 Low	 Medium

Source: BIS Research Analysis
Table: 2.2 Impact Analysis: Market Restraints

Market Restraints	1-2 Years	3-5 Years
Dearth of Skilled Radiologists	 High	 Low
Restrictive Reimbursement Landscape	 Medium	 Low
Radiation Risks from Diagnostic Imaging Modalities	 High	 Low

Source: BIS Research Analysis

2.3 Market Drivers

The diagnostic imaging technology sector is facing significant changes in its market dynamics as new methodologies, technologies, and practices are currently being introduced in the market. This sector is going through a period of amendments, driven by increasing combined demand for emerging technologies and its adoption in the healthcare sector. Several factors ranging from its demand and rising aging population to secure economic development in the emerging nations are driving the growth of the portable imaging solutions market.

2.3.1 Increasing Geriatric Population Changing the Adoption Pattern for Diagnostic Imaging Modalities

The rapid increase in the aging population in both developing and developed economies is changing the overall healthcare market scenario in all the regions. The growing geriatric population has led to increased rate of chronic disorders such as heart diseases, cancer, and diabetes. To meet the demand, cost-effective diagnostic imaging systems are required to offer high-quality patient care for the geriatric population. This factor is expected to contribute as a driving force for the growth of the global portable imaging solutions market.

- For instance, according to the estimates of World Health Organization (WHO), the global elderly population will increase from 12% to 22% from the year 2010 to 2020.
- Furthermore, According to National Institute of Aging, U.S., the number of people aged 65 years or older is expected to grow from an estimated 524 million in 2010 to nearly 1.5 billion in 2050, with a maximum increase in the developing countries.

Table: 2.3 Number and Distribution of Persons Aged 60 Years or Over by Region (2017 and 2050)

Regions	Number of persons aged 60 years or older in 2017 (millions)	Number of persons aged 60 years or over in 2050 (millions)	Percentage change between 2017 and 2050 (percentage)	Distribution of older persons in 2017 (percentage)	Distribution of older persons in 2050 (percentage)
World	962.3	2080.5	116.2	100.0	100.0
Africa	68.7	225.8	228.5	7.1	10.9
Asia	549.2	1273.2	131.8	57.1	61.2
Europe	183.0	247.2	35.1	19.0	11.9
North America	78.4	122.8	56.7	8.1	5.9
Latin America	76.0	198.2	160.7	7.9	9.5

Oceania	6.9	13.3	92.6	0.7	0.6
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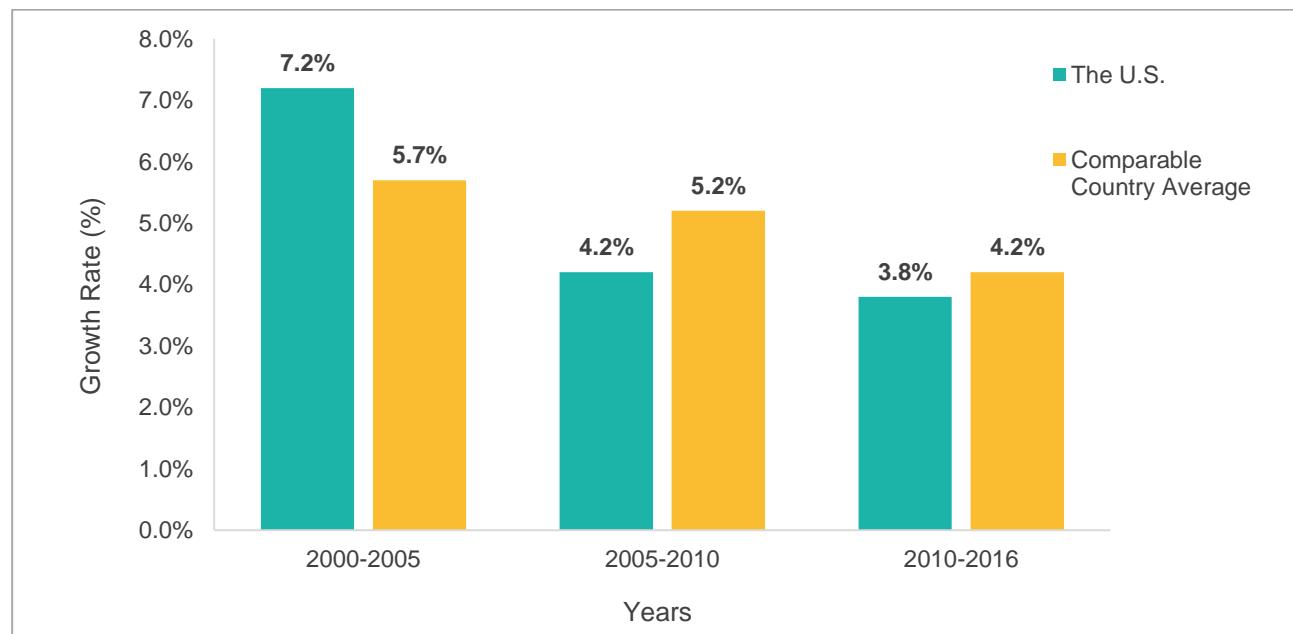
Source: *United Nations (2017) and BIS Research Analysis*

2.3.2 Increasing Healthcare Spending in Developing Economies expected to lead the Increased Uptake of Diagnostic Imaging Systems

Emerging economies have significantly been investing over healthcare organizations, which is expected to boost the uptake of advanced medical diagnostic imaging devices as these economies are also facing a massive increase in geriatric population and increasing awareness about advanced imaging procedures.

- According to World Health Organization (WHO), developing regions had increased their healthcare expenditure by 3% from 2000 to 2003 and 9% from 2003 to 2006. Moreover, the East Asia region accounted for nearly 44% increase from the year 2008 to 2009 whereas Latin America accounted for almost 10%-15% increase in Government Health Care Spending (GHC-S).
- From 2005, a decrease in the growth rate of health spending in developed economies, such as the U.S., was observed when compared to other emerging economies.

Figure: 2.2 Change in Annual Growth Rate in Total Healthcare Expenditure



Source: *BIS Research Analysis*

2.3.3 Increasing Support from Government

Governments of several economies are taking initiatives, which are expected to drive the growth of this market. These initiatives are implemented to support hospitals and research organizations in development and easy access to more advanced and improved medical imaging sector.

Also, support of the government in providing reimbursement facilities to the end-users makes the diagnostic imaging process affordable and easily accessible.

- For instance, according to the Australian Diagnostic Imaging Association's 2017-18 budget, more than nine million Australians will have access to 24 million individual radiology services, including x-ray, ultrasound, CT, and MRI, among others.

Many healthcare institutions are focused on adopting equipment that can be used for a broad range of applications and can be handled easily. For instance, handheld ultrasound scanner systems offer high return-on-investment due to their inter-departmental use in a single hospital or healthcare institution.

2.4 Market Restraints

Regardless of various technological advancement in the portable imaging solutions market along with the improvement in healthcare sector or radiology workflow, this market still faces several challenges and restraints, which are common in different healthcare settings across the globe. The factors such as a shortage of skilled radiologists, restrictive reimbursement landscape, radiation risks from diagnostic imaging modalities, and increasing errors in diagnostic imaging procedures are hampering the growth of the market.

2.4.1 Dearth of Skilled Radiologists

Storage of skilled radiologists is one the common factors, which are hampering the growth of the portable imaging solutions market as the market has been witnessing an increasing number of the patient pool on the global level.

This can be observed in a current healthcare landscape where diagnostic imaging volume is increasing at a much faster rate when compared with the pace at which the new radiologists are entering the field.

Despite the introduction of new technologies and integration of different medical workflow, radiologists are still facing various challenges such as the process of radiology landscapes being highly fragmented.

Other challenges, including no or limited standardization of the protocol, increasing medical complexity, variance in radiation and contrast dose exposition, and high workload of radiology personnel, are also hampering the market growth.

2.4.2 Restrictive Reimbursement Landscape

The healthcare market is witnessing a primary medical cost containment in which reimbursement rate is also lowered down. This is likely to limit the growth of the portable imaging solutions market on global level.

- For instance, the reimbursement rate is lowered down by nearly 50% from the year 2000 to 2015 in the U.S. Moreover, a similar trend is also observed in several Europe countries, such as France, and Asia-Pacific countries, such as Japan and Australia.
- According to American Medical Association (U.S.), low reimbursement rates under Medicaid have restricted the effect of the Affordable Care Act (ACA), resulting in limited participation from provider sides.

The lowering of reimbursement rate results in hampering the hospital's disposable income while negatively affecting the investment and purchase of medical imaging modalities and limits the hiring of technicians and radiologists.

2.4.3 Radiation Risks from Diagnostic Imaging Modalities

Diagnostic imaging tests are non-invasive tests, which play an essential role in the prevention and treatment of various type of diseases. These modalities work by capturing the imaging of internal organs, tissues, and bones. However, some of these modalities emit ionizing radiations, which pose a threat of increased health risks.

For instance, X-rays and CT systems emit electromagnetic waves to detect bones and dental decays, and internal injuries and bleeding, respectively. Moreover, ultrasound system emits high-frequency sound waves to detect any abnormalities in civil structures.

Ionizing radiation directly affects the human cells and damages the DNA resulting in the development of more chronic disorders. These tests are often harmful, especially in cases where a large number of tests are performed in a short duration of time. This factor serves as the major obstacle to the growth of the portable imaging solutions market.

Table: 2.4 Ionizing Radiation Modalities

Imaging Tests	Ionizing Radiation	No Ionizing Radiation
X-Rays	✓	
MRIs		✓
CT Scans	✓	
Ultrasound		✓
Nuclear Medicine Scans	✓	

Source: BIS Research Analysis

2.4.4 Increasing Errors in Diagnostic Imaging

Radiology is considered as one of the specialties which are the most liable to medical negligence. The etiology of radiological error is multi-functional. The healthcare industry is witnessing tremendous growth in the number of patients, and consequently, there is an increase in the data volume to be analyzed. The situation stands in sharp contrast to the current availability of the radiologists in hospitals, who form a crucial part of the diagnosis process but are extremely limited in number.

- For instance, according to the study conducted by International Business Machines Corporation (IBM), medical images currently account for more than 90% of all medical data, making it the most significant data source in the healthcare industry.

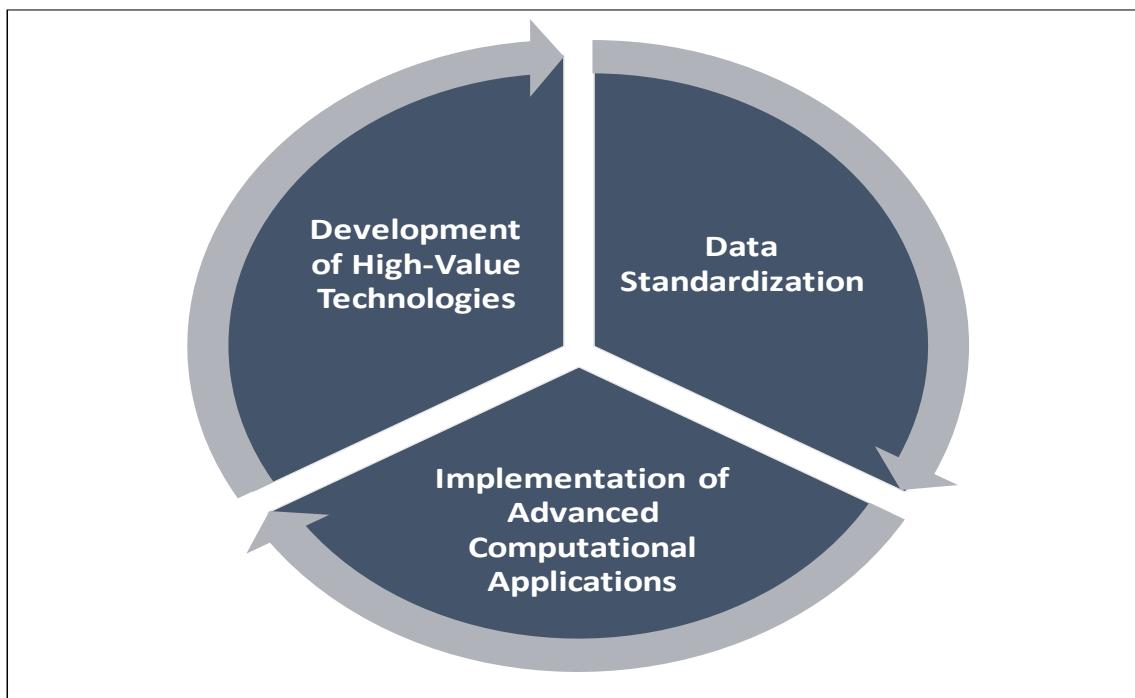
The error rate among radiology exams is approximately 30%, with real-time errors in daily radiology practice averaging 3%-5%. More than 75% of all medical malpractice claims against radiologists are related to diagnostic errors. Handling large volume and complex data set of the large pool of patients is a tedious task and is prone to human errors, which at times, lead to a wrong data interpretation. Such factors act as a restraining force for the growth of the market.

2.5 Market Opportunities

The overall diagnostic imaging market holds many tremendous opportunities, as today, the advancement in the computation technologies and its implementation in healthcare sector offer various technological advancement, such as the use of Electronic Medical Records (EMR) in creating a database of patients along with the introduction of cloud services to store and exchange data. Thus,

implementation of these technologies in diagnostic imaging modalities can change the dynamics of the market, driven by the correct evidence-based approach, quantitative assessment, and high-value technologies.

Figure: 2.3 Future Potential of Diagnostic Imaging Market

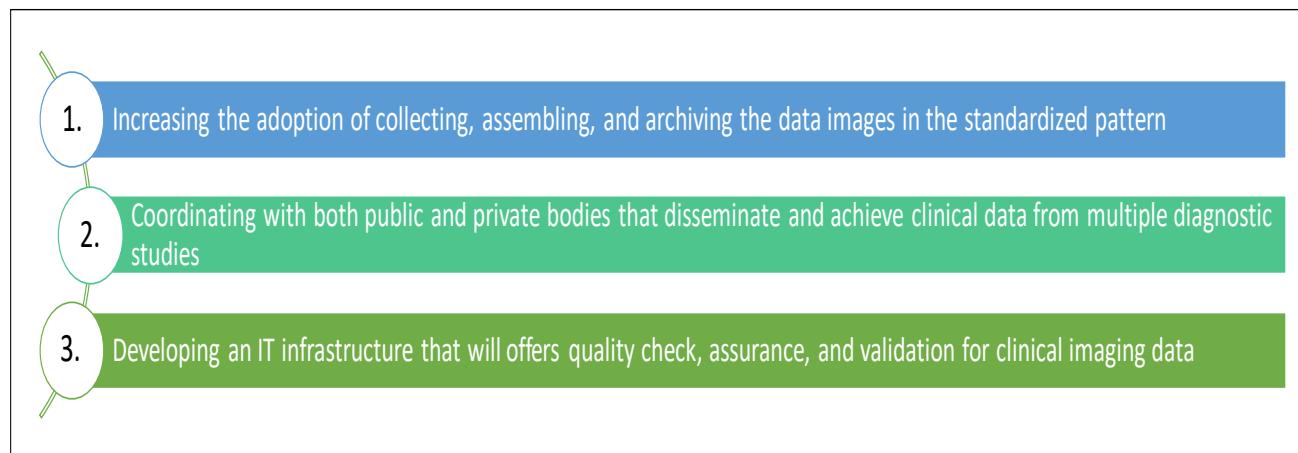


Source: BIS Research Analysis

2.5.1 Standardization of Image Acquisition and Storage

The standardization of image acquisition and storage in the diagnostic imaging modalities can result in the generation of patient databases. These patient databases are likely to help the physicians and various research studies by offering comparative analysis on a broader level, through which, the practitioner can analyze the historical pattern of the patient's conditions over the course of time allowing better image-guided patient care. This, in turn, will also reduce the complexity, duration, and cost of treatment.

Several healthcare institutions and government bodies such as the National Cancer Institute and National Institute of Health, U.S. have identified the advantages of creating a large data ecosystem. In this ecosystem, data from the clinical and research activities, coupled with patient clinical data, is collected, organized, and assembled for use in both human and machine analysis. The following figure depicts the steps for standardization of image acquisition and storage:

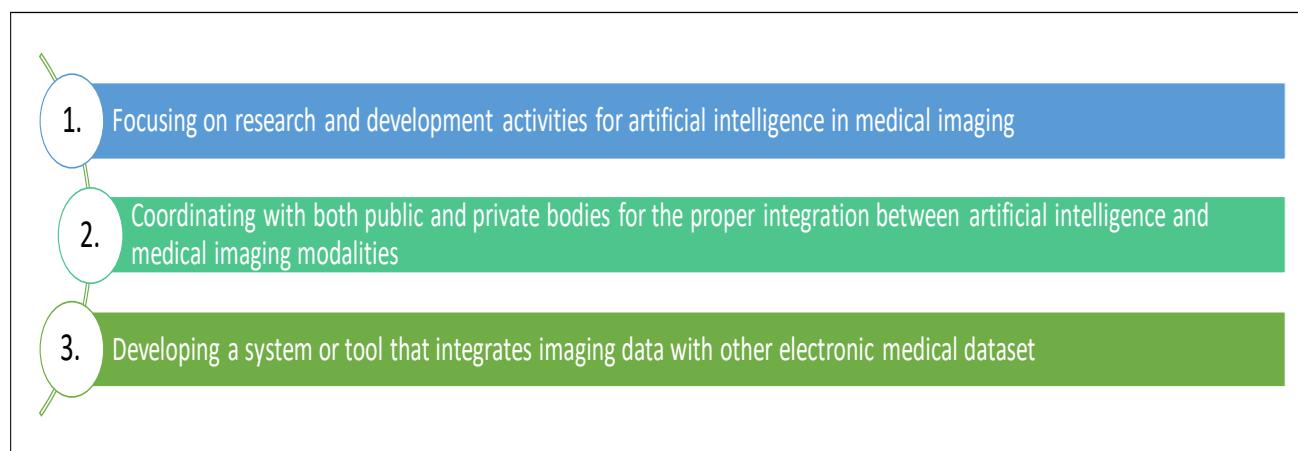
Figure: 2.4 Standardization of Image Acquisition and Storage: Steps

Source: *BIS Research Analysis*

2.5.2 Implementation of Machine Learning and Advanced Computation to Medical Imaging

The implementation of computational capacity applications, such as artificial intelligence, including machine learning and deep learning to analyze imaging data is likely to enhance the decision-making for diagnosis and drug treatment options as well as clinical interventions.

Collectively, these computational applications are also expected to improve predictive analysis to support full healthcare delivery systems. Through this, researchers and practitioners could generate and access several observational results to create large sample sizes for their studies. The following figure depicts the steps for integration of computational applications to medical imaging:

Figure: 2.5 Integration of Computational Applications to Medical Imaging: Steps

Source: *BIS Research Analysis*

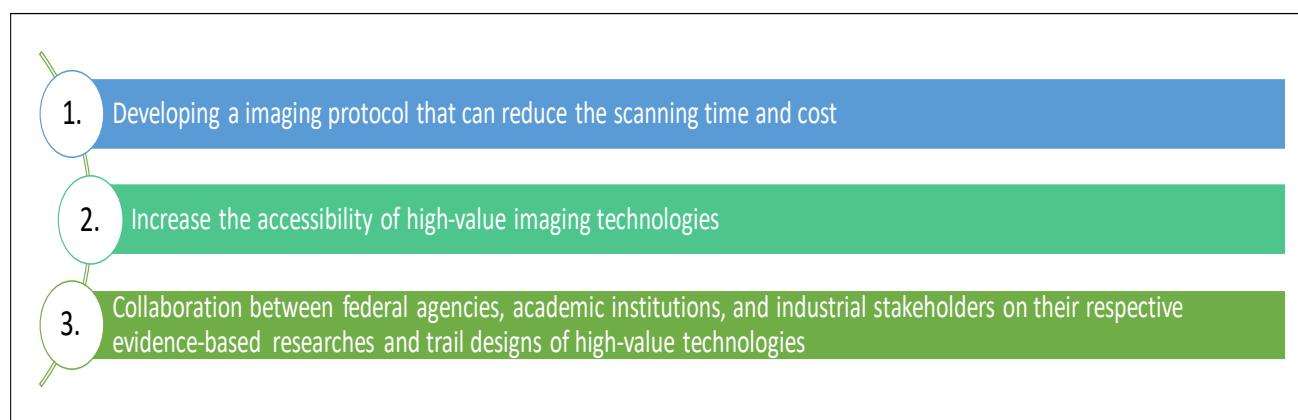
2.5.3 Accelerating the Development of High-Value Imaging Technologies

Collaboration, partnership, and knowledge-sharing among different agencies (public and private) during the initial phase of new technology development is expected to result in accelerating the approval and evaluation of new technology and reducing the time frame from the laboratory to the market.

This knowledge-sharing among the agencies results in broadening the concept and awareness about the latest techniques utilizing the limited resources. Currently, several types of research in academic institutions are conducted neglecting the commercialization and reimbursement concerns. However, they submit their research proposals to funding agencies such as Department of Defence (DOD) and National Science Foundation (NSF), with limited knowledge of clinical trial process required for Food and Drug Administration (FDA) approvals and Centers for Medicare & Medicaid Services (CMS) reimbursement.

Proper coordination among academic institutions or industry investigators and funding agencies could eliminate some barriers that can slow the transformation of new technology into clinical practice. The following figure depicts the steps for accelerating the development of high-value imaging technologies:

Figure: 2.6 Accelerating the Development of High-Value Imaging Technologies: Steps



Source: BIS Research Analysis

2.6 Market Trends

The medical diagnostic imaging solutions market is witnessing various disruptive trends as the end users demand effective, fast, precise, and inexpensive diagnostic treatment.

2.6.1 Shift toward Value-Based Radiology Care

The healthcare system is witnessing a shift from volume-based care to value-based care. This shifting landscape aims to improve the outcomes without raising the healthcare cost. This is done through the elimination of duplicated images through which observational results are generated at a faster rate as well as the unnecessary steps of diagnostic imaging procedures are eliminated.

Moreover, manufacturers of medical devices, technology, and services can also add value to this value-based care by offering technology to the hospitals or other healthcare institutions, which are in the transition from fee-for-service to value-based care.

- For instance, Carestream Health's analytics module provides a dashboard platform that can collect, aggregate, and present data according to the numerous factors. This analytic tool can also analyze the scanned image for many indications such as coronary calcification, osteoporosis, fatty liver, and emphysema.

2.6.2 Miniaturization and Technological Advancement in the Diagnostic Imaging Technologies

Diagnostic imaging modalities, such as ultrasound systems, are on the verge of integration with the healthcare IT technology as they offer remote access to the providers to access patient's medical records and vitals along with the real-time assessments improving patient outcomes.

The introduction of new technologies such as contrast-enhanced ultrasound in 2017 and the product approval of first ultrasound contrast agents for liver diagnostic imaging by U.S., FDA are also urging the growth of the portable imaging solutions market.

Combination of ultrasound contrast agents with ultrasound equipment is beneficial for both patients and providers by offering enhanced diagnostic capabilities.

The manufacturers are more focused on introducing lighter, smaller, and more portable ultrasound systems. This trend helps to expand the market penetration of ultrasound from the hospital's departments to primary care settings and emergency units.

Another trend in the market is the evolution of 3D tools with matrix array probes and magnetic sensors that offer volumetric visualization and enhance the safety of the procedure by lowering cost and time.

3. Competitive Landscape

Competitive landscape includes all the key developments and strategies, which took place from January 2015 to September 2018, in the global portable imaging solutions market. The key developments and strategies mapped are as follows:

- Product Approvals and Launches
- Funding
- Awards and Recognition
- Agreements
- Mergers and Acquisitions

The other section of this chapter includes industry attractiveness (Porter's Five Forces Analysis) for investors of the global portable imaging solutions market.

Note:

- The detailed lists of key developments and strategies mapped from January 2015 to September 2018 are covered in Annexure I.
- The detailed lists of product mapping existing in the market are covered in Annexure III.

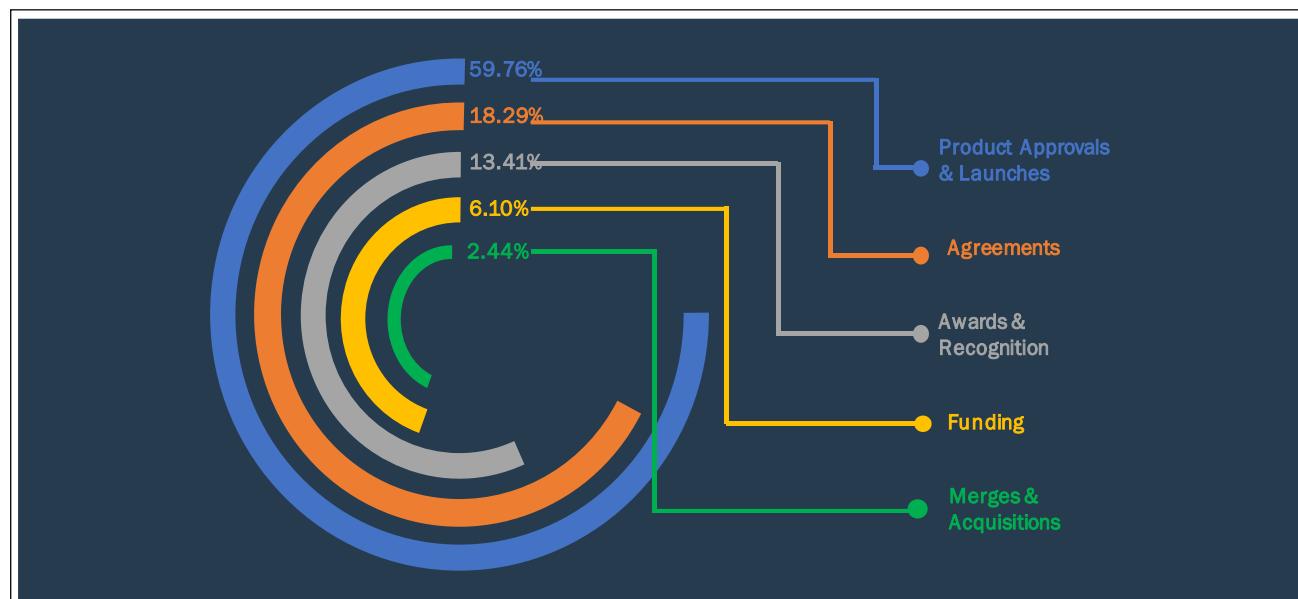
The following figure underlines the two aspects that have been considered while evaluating the competitive landscape for the global portable imaging solutions market. The key developments and strategies have been tracked from January 2015 till September 2018. In addition, the industry attractiveness has been considered via the Porter's Five Forces Analysis.

3.1 Key Strategies and Developments

The global portable imaging solutions market has witnessed tremendous growth in the past decade, owing to increased adoption in various healthcare facilities. The manufacturers are more focused on making strategic efforts to sustain in the intensely competitive market.

From past three years (January-2015 to September-2018), it has been observed that the key manufacturers are making more strategic effort to introduce technologically advanced products. Further, several start-up enterprises are granted different type of funding to increase their market footprints. Till 2015, the market witnessed approximately 49 product launches and approvals, 11 awards and recognition, 15 agreements, two mergers and acquisitions, and 5 funding.

Figure: 3.1 Percent Share of Key Developments and Strategies (January-2015 to September-2018)



Source: BIS Research Analysis

The preceding figure depicts the percent share of major strategies adopted by the key market players.

Product approvals and launches holds the largest share, followed by various strategic agreements such as partnership, collaboration, and distribution agreements.

The succeeding segments provides an overview of the key strategies and developments in the global portable imaging solutions market, mainly from the year 2015, to emphasize the potential that exists in the market.

3.1.1 Product Approvals and Launches

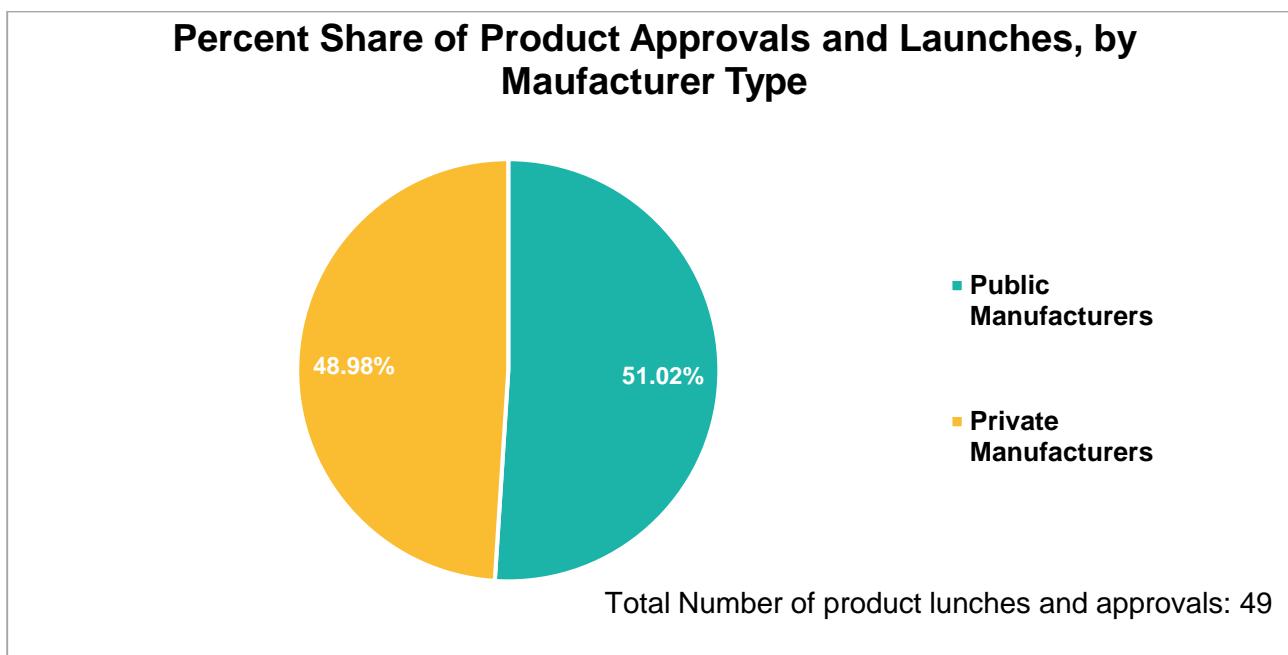
Several manufacturers have incorporated product approvals and launches as a key developmental strategy to sustain in the market. Through this strategy, manufacturers offer technologically advanced products in the market to gain a strong brand image in the global portable imaging solutions market. The market witnessed nearly 49 product approvals and launches in the past three years (January-2015 to September-2018).

The succeeding figure depicts the percent share of private or start-up players, which constituted nearly 48.98% of the total share of synergic developments witnessed by the market, and public

manufacturers constituted more than 51.0% of the total share with 25 product approvals and launches from January 2015 to September 2018.

Private players include Clarius Mobile Health, Oehm und Rehbein GmbH, EchoNous, Inc., Healcerion, Inc., Butterfly Network, Inc., and Rivanna Medical, LLC, among others. Public players include General Electric Company, Fujifilm Holdings Corporation, Canon Inc., Hitachi, Ltd., and Koninklijke Philips N.V., among others.

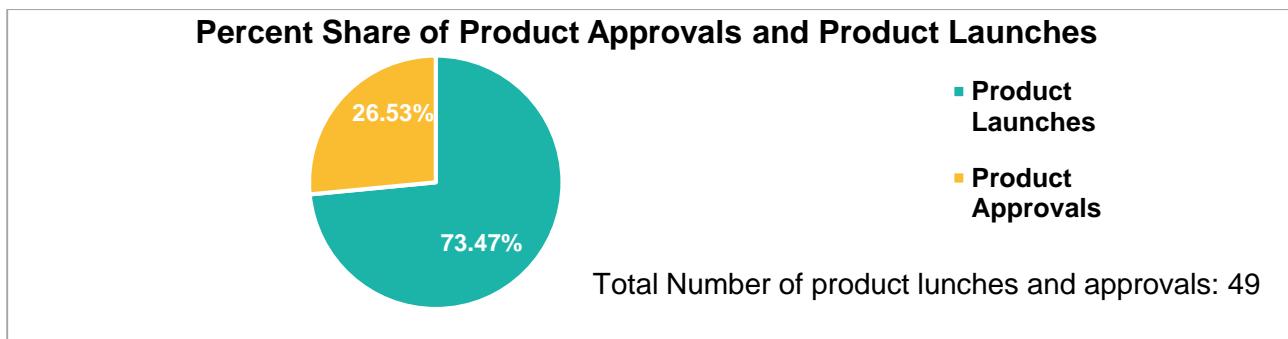
Figure: 3.2 Percent Share of Product Approvals and Launches by Key Players (January-2015 to September-2018)



Source: BIS Research Analysis

The succeeding figure depicts percent share of total product launched and approvals by manufacturers from January 2015 to September 2018. The market has also witnessed more than 36 product launches and 13 product approvals. All the product approvals and launches were aimed at the expansion of product portfolio by strengthening each company's growth potential.

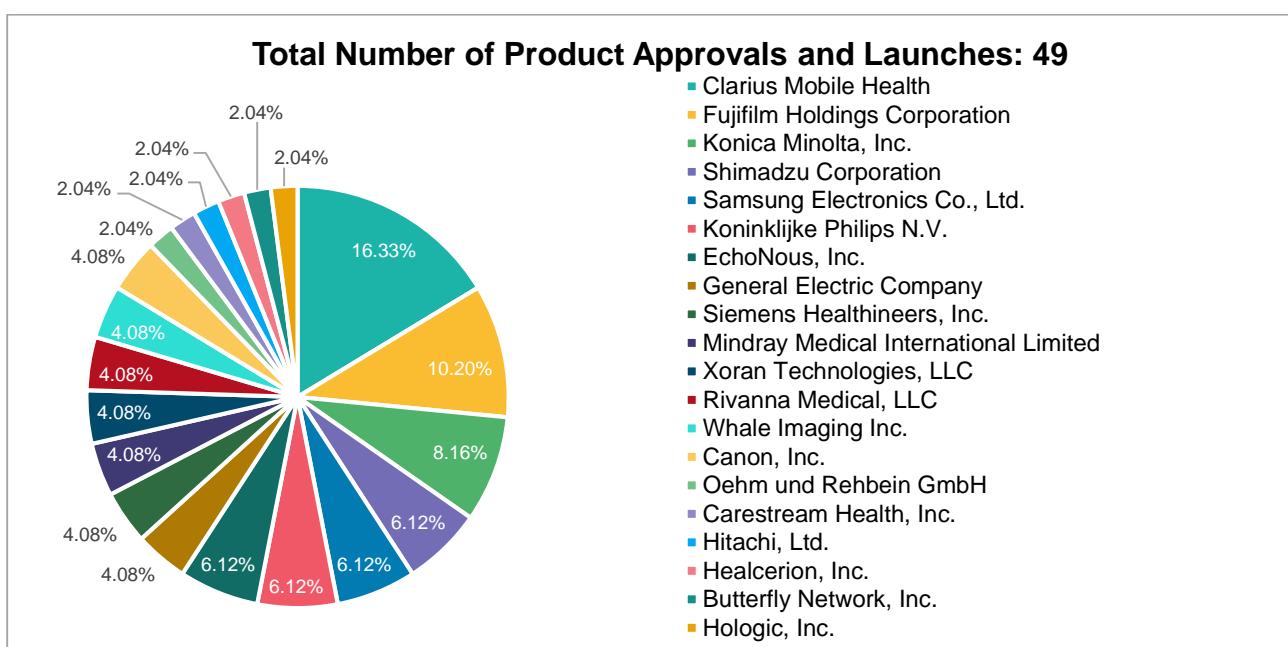
Figure: 3.3 Percent Share of Product Approvals and Launches (January-2015 to September-2018)



Source: BIS Research Analysis

Several companies, including Clarius Mobile Health Corp., General Electric Company, Konica Minolta, Inc., Shimadzu Corporation, Siemens Healthineers, Inc., Samsung Electronics Co., Ltd., and Fujifilm Holdings Corporation, received a significant number of product approvals and launches. Clarius Mobile Health Corp. received the maximum number of product approvals and launches in the past three years (January-2015 to September-2018). Also, Fujifilm Holdings Corporation registered the second largest share of product launches from January 2015 to September 2018, for portable ultrasound systems. The following figure provides a percent share of product approvals and launches by the key players in the global portable imaging solutions market in the time frame of 2015-2018:

Figure: 3.4 Percent Share of Product Approvals and Launches by Key Players (January-2015 to September-2018)



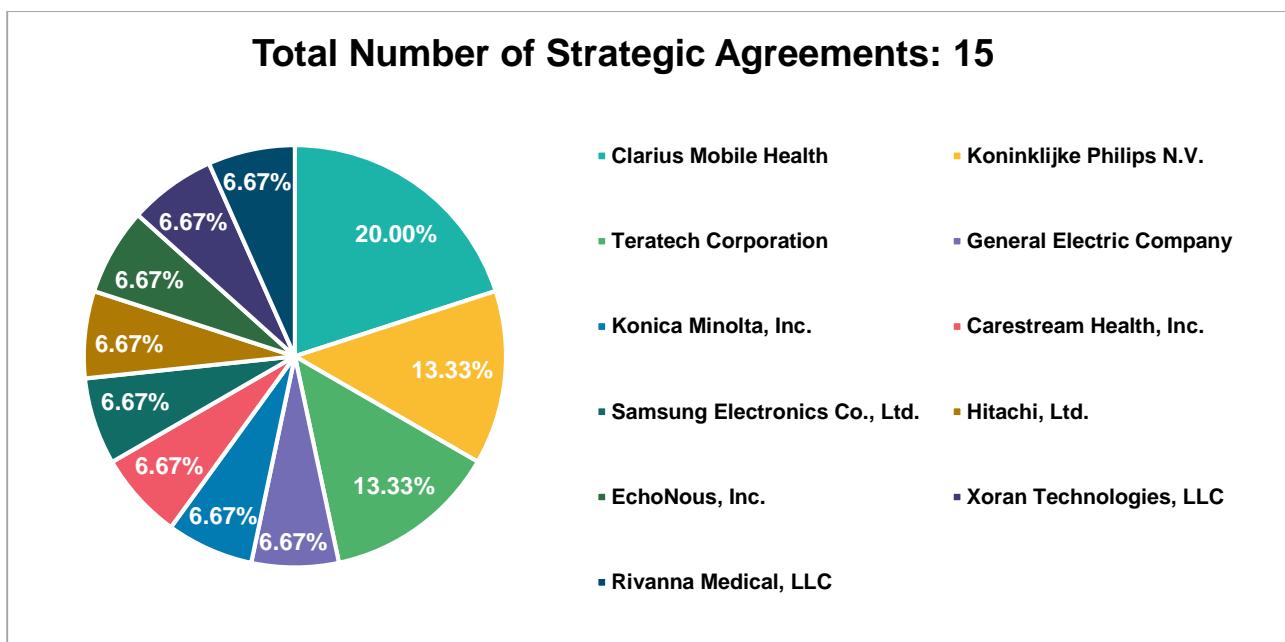
Source: BIS Research Analysis



3.1.2 Agreements

The global portable imaging solutions market is secondly dominated by strategic agreement constituting nearly 18.29% of the total key strategic developments. This strategic agreement includes partnerships, collaborations, and distributions agreement with total 15 developments. Clarius Mobile Health Corp. constituted 20.00% of the total share in these strategic agreements and was followed by Koninklijke Philips N.V., and Teratech Corporation with 13.33% each. These strategies were aimed to increase the regional footprints and to expand the product portfolio in different applications. Remaining players such as General Electric Company, Konica Minolta, Inc., Carestream Health, Samsung Electronics Co., Ltd., Hitachi, Ltd., EchoNous, Inc., Xoran Technologies, LLC, and Rivanna Medical, LLC holds nearly 6.67% each in this strategy. The following figure provides a percent share of the total number of strategic agreements by the key players in the global portable imaging solutions market in the time frame of 2015-2018:

Figure: 3.5 Percent Share of Strategic Agreements by Key Players (Januar-2015 to September 2018)



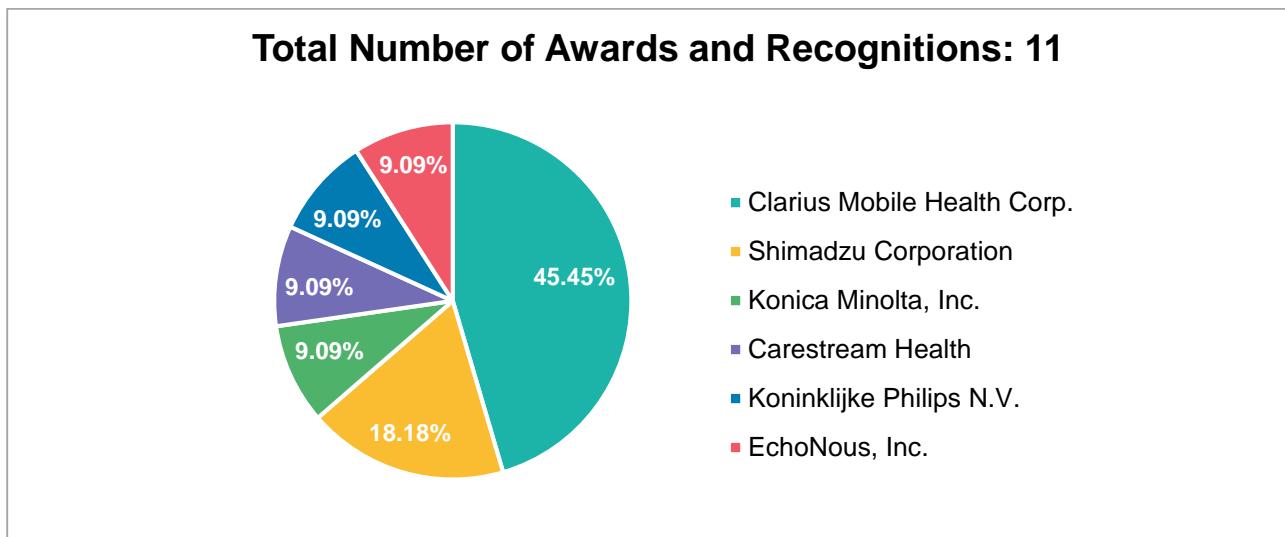
Source: BIS Research Analysis

3.1.3 Awards and Recognition

Several players in the global portable imaging solutions market are granted with various awards and recognition. This strategy collectively constituted for 13.41% of total key developmental strategies with nearly 45.45% of share by Clarius Mobile Health Corp. These awards are implemented for unique innovations and out-understanding performance in the portable imaging solutions market. For instance, in 2018, Carestream Health was recognized with best product design for its DRX Revolution Nano mobile X-ray system. Moreover, in 2017, Clarius Mobile Health Corp. was awarded three times

for its unique product offering, and Shimadzu Corporation was awarded for best strategic product launches in the global diagnostic X-rays imaging systems market. The following figure depicts the percent share of the total awards and recognitions received by the key players.

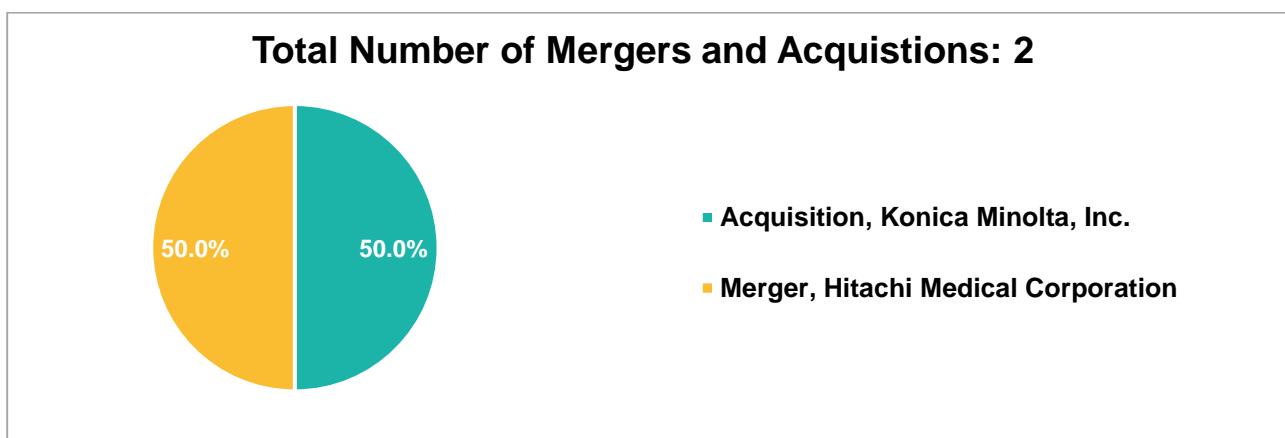
Figure: 3.6 Percent Share of Awards and Recognitions by Key players (January 2014-September-2018)



Source: BIS Research Analysis

3.1.4 Mergers and Acquisitions

The strategic mergers and acquisitions constituted nearly 2.44% of the total key developmental strategies. For instance, in July 2015, Konica Minolta, Inc. acquired Sawae Technologica Ltda. to expand its sales footprint in Brazil market. In August 2015, Hitachi Medical Corporation merged with Hitachi Aloka Medical to strengthen its medical business segment. The following figure depicts the percent share of the total number of mergers and acquisitions done by the key players.



Source: BIS Research Analysis

3.1.5 Funding

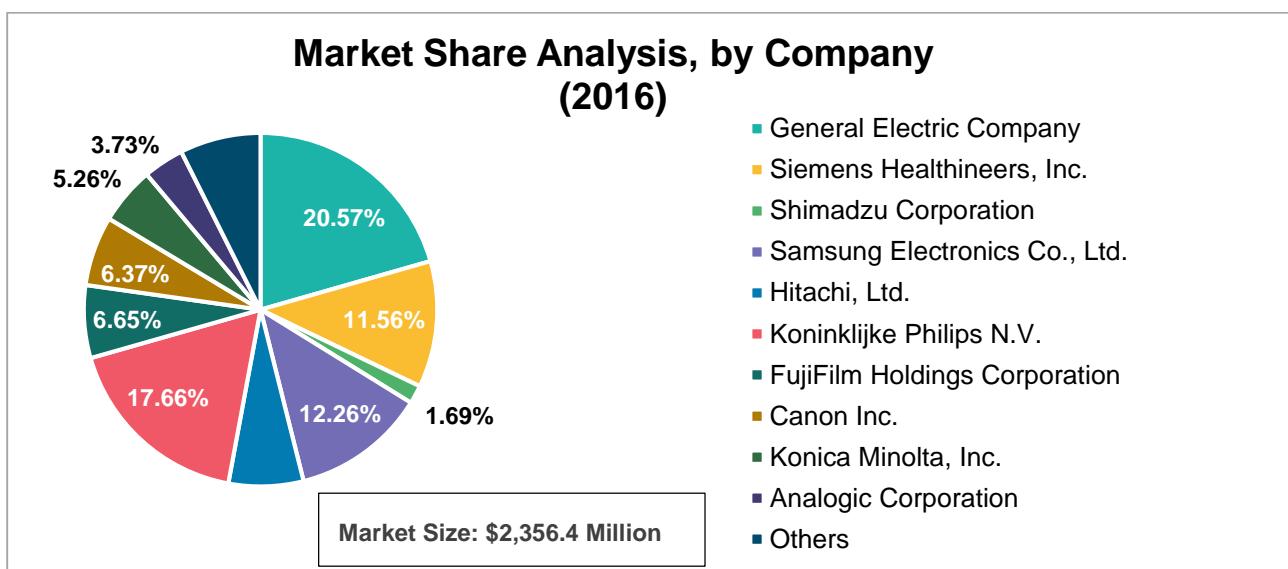
Some of the start-up or private manufacturers are funded by various investment firms such as KKR & Co. Inc. and by public organizations such as National Institutes of Health (NIH). These funding were aimed at advancing handheld ultrasound images to increase the market penetration of the handheld ultrasound scanners. EchoNous, Inc. raised \$70 million funding from KKR & Co. Inc., Clarius Mobile Health Corp. received funding from the National Sciences and Engineering Research Council of Canada (NSERC), to collaborate with University of Alberta (Canada). Moreover, Rivanna Medical, LLC raised \$5 million in funding from National Institutes of Health (NIH) and other investors to expand market footprints of its flagship product.

3.2 Market Share Analysis

Portable imaging solutions have revolutionized radiologist practices through the introduction of technologically advanced products and their increased adoption among their end users. These portable imaging solutions are becoming the most lucrative opportunities for giant companies as a lot of companies can be seen coming up with their focus only on developing multiple application targeted products. Major manufacturers of portable imaging solutions are located globally, and the following figure illustrates the market share analysis of these players working actively in the global portable imaging solutions market for the year 2016. The sales of Canon, Inc. in 2016 is estimated based on the sales of Toshiba Corporation in the previous year.

3.2.1 Market Share Analysis, by Company

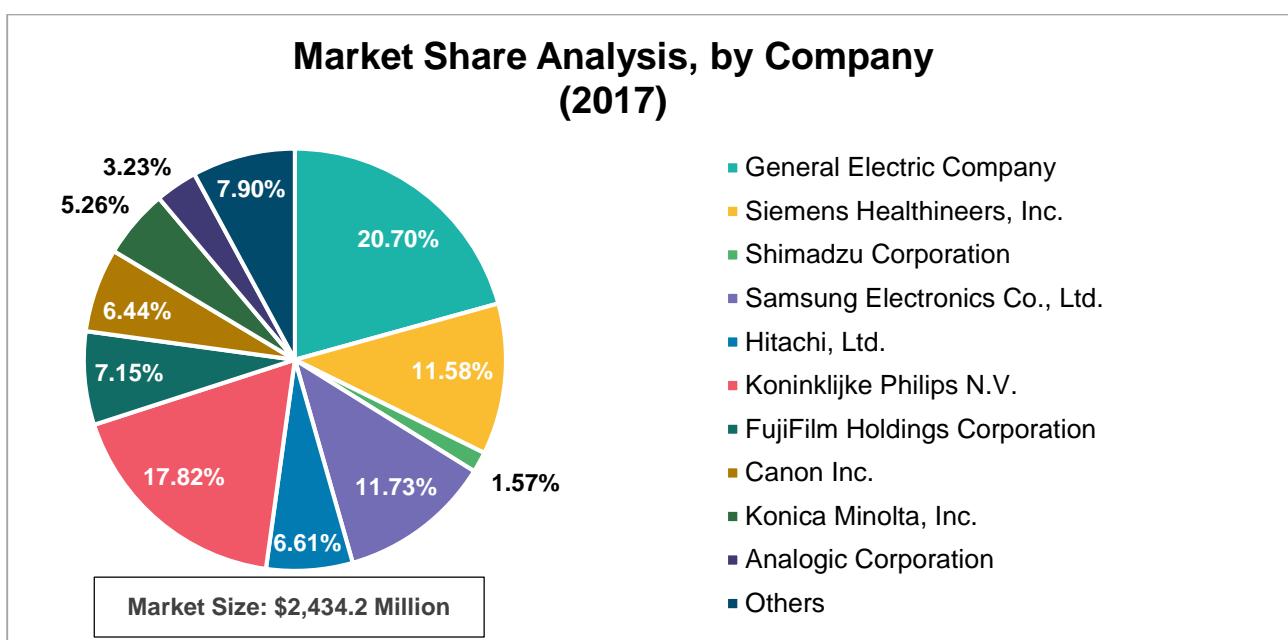
Figure: 3.7 Market Share Analysis for the Global Portable Imaging Solutions Market, by Company (2016)



Source: BIS Research Analysis

The market share of the global portable imaging solutions market was calculated from the views of industry experts, product portfolio, and competitive strategies followed by manufacturers. The total market was valued at \$2,356.4 million in 2016 with General Electric Company dominating the global portable imaging solutions market by holding 20.57% of the market share in 2016. This market dominance was attributed to the company's presence within the market and the diverse range of product offerings. Koninklijke Philips N.V. was responsible for 17.66% of the global market share in 2016, second only to General Electric Company.

Figure: 3.8 Market Share Analysis for the Global Portable Imaging Solutions Market, by Company (2017)



Source: BIS Research Analysis

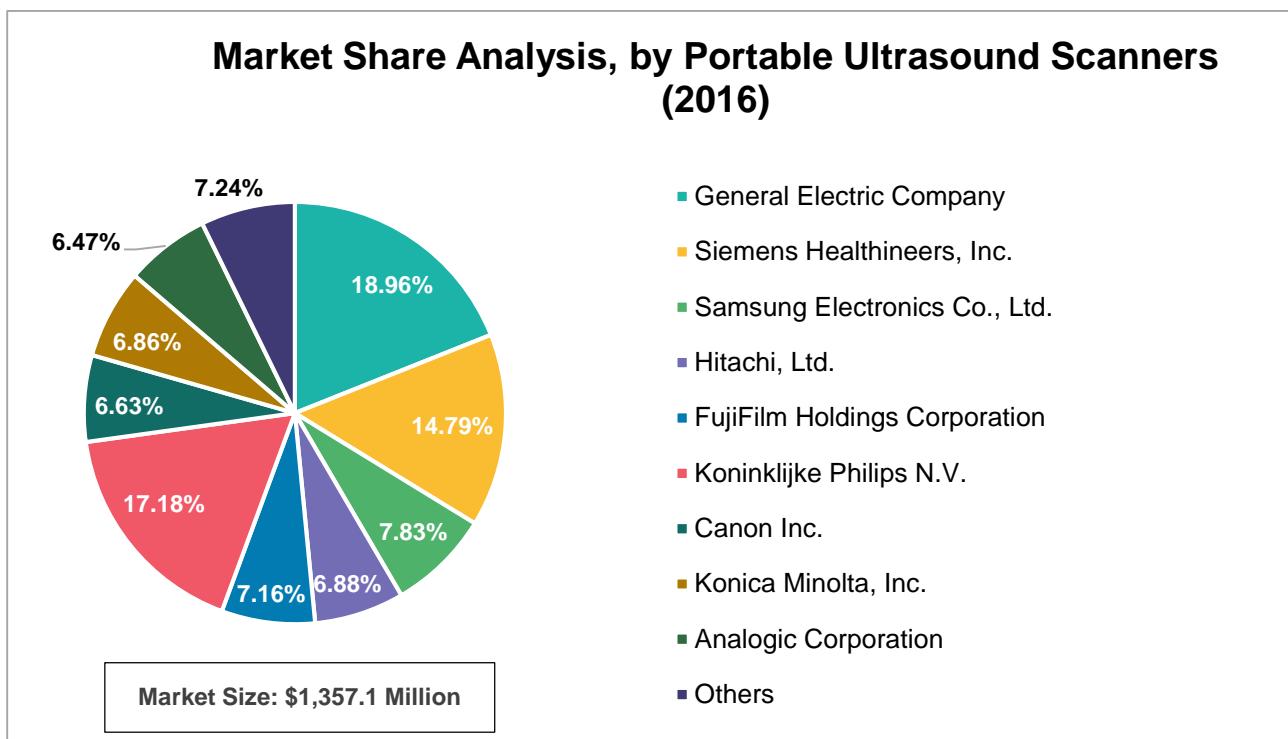
In the year 2017, the market share of the global portable imaging solutions market was estimated under similar stipulations as in 2016. General Electric Company dominated the global portable imaging solutions market by holding approximately 20.70% of the market share in the year 2017.

This market dominance was attributed to the company's presence within the market and introduction of technologically advanced products such as Vscan handheld ultrasound scanners. As a continuation of the previous year, Koninklijke Philips N.V. was second to General Electric Company. Koninklijke Philips N.V. was responsible for 17.82% of the global market share, in 2017. In 2017, Siemens Healthineers, Inc. looked to further strengthen its presence in the market by launching portable ultrasound scanners and mobile X-rays systems. The other prominent companies in global portable imaging solutions market include Samsung Electronics Co., Ltd., Hitachi, Ltd., Fujifilm Holdings Corporation, Canon Inc., Konica Minolta, Inc., and Analogic Corporation. As for the other

companies' segment, there has not been any significant growth within one year. In 2016, the segment accounted for 7.40% of the global market share, however, in 2017, the segment accounted for 7.90% of the global market share.

3.2.2 Market Share Analysis, by Portable Ultrasound Scanners

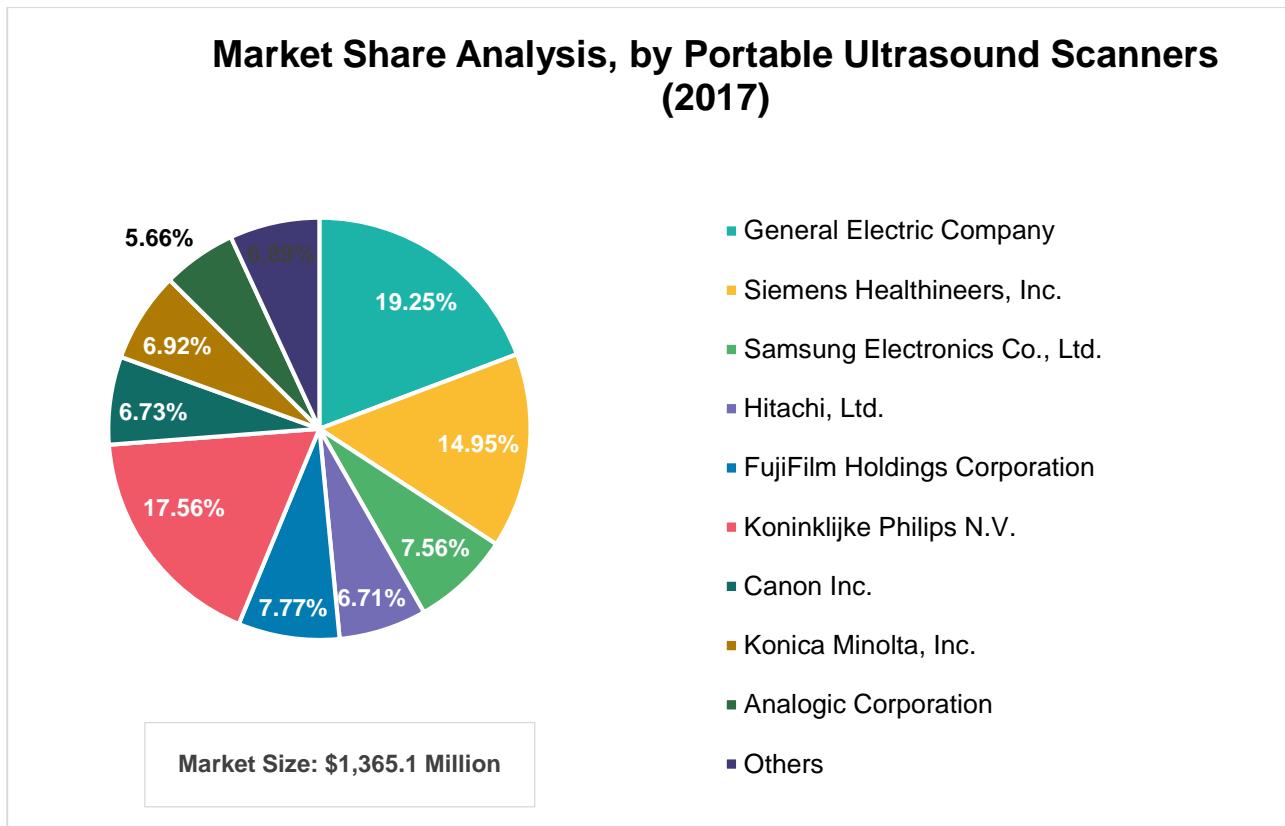
Figure: 3.9 Market Share Analysis for the Global Portable Imaging Solutions Market, by Portable Ultrasound Scanners (2016)



Source: *BIS Research Analysis*

The global portable ultrasound scanners market was valued at \$1,357.1 million in 2016. General Electric Company dominated the global portable ultrasound scanners market by holding approximately 18.96% of the market share in the year 2016. This was followed by Koninklijke Philips N.V. occupying nearly 17.18% of the global portable ultrasound scanners market in 2016.

Figure: 3.10 Market Share Analysis for the Global Portable Imaging Solutions Market, by Portable Ultrasound Scanners (2017)

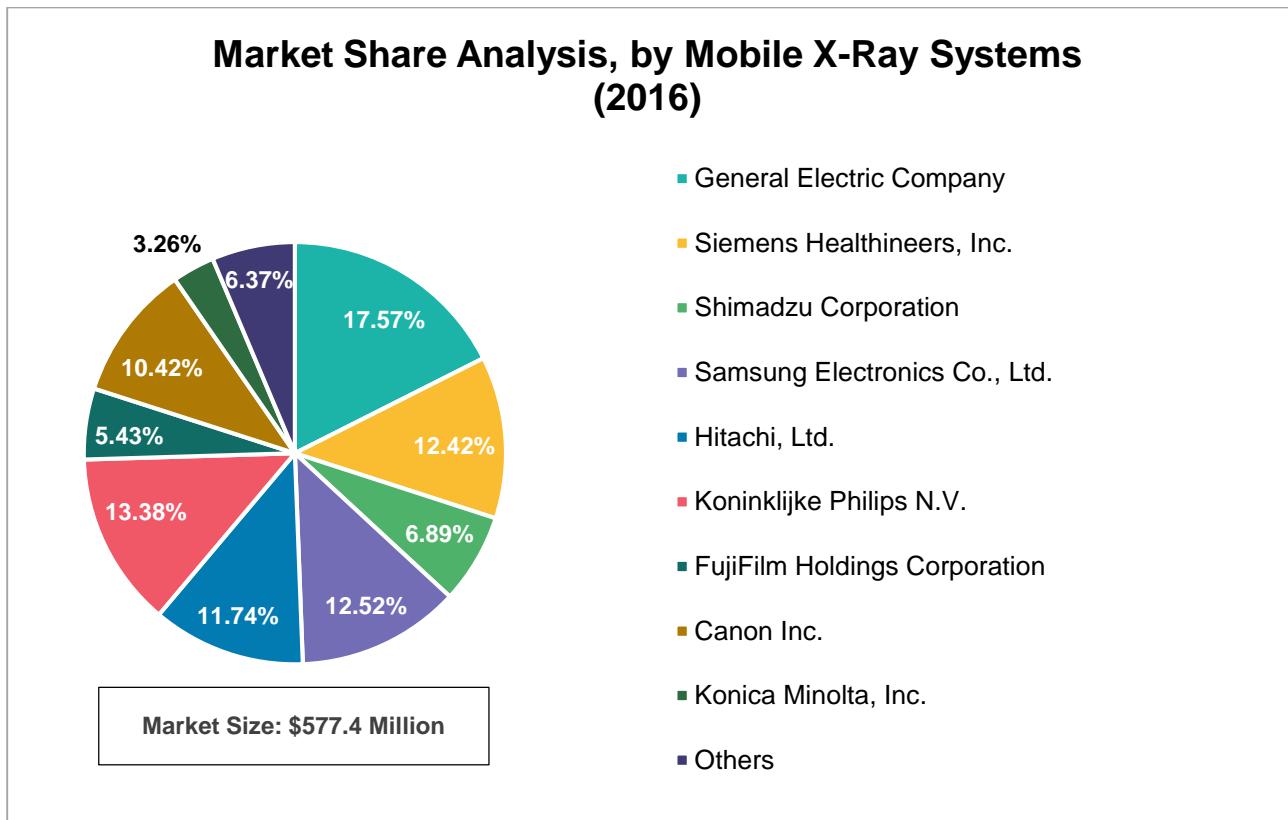


Source: BIS Research Analysis

The global portable ultrasound scanners market was valued at \$1,365.1 million in 2017. General Electric Company dominated the global portable ultrasound scanners market by holding approximately 19.25% of the market share in the year 2017. The market dominance of General Electric Company can be attributed to the increased sales of ultrasound segment in 2017. This was followed by Koninklijke Philips N.V. which occupied nearly 17.56% of the global portable ultrasound scanners market in 2017. The share of other manufacturers includes Esaote SpA, Mindray Medical International Limited, and Echo Control Medical.

3.2.3 Market Share Analysis, by Mobile X-Ray Systems

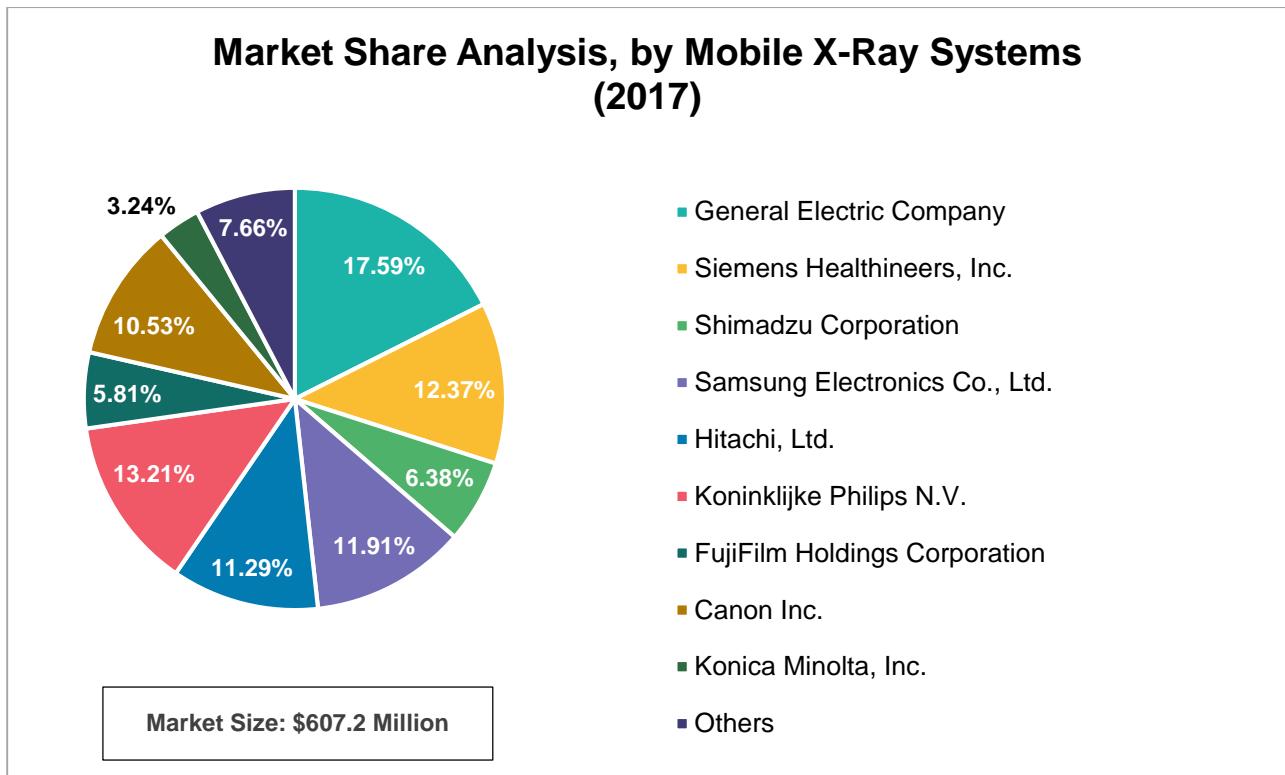
Figure: 3.11 Market Share Analysis for the Global Portable Imaging Solutions Market, by Mobile X-Ray Systems (2016)



Source: BIS Research Analysis

The global mobile X-ray systems market was valued at \$577.4 million in 2016. General Electric Company dominated the global mobile X-ray systems market by holding approximately 17.57% of the market share in 2016. This was followed by Koninklijke Philips N.V. occupying nearly 13.38% of the global mobile X-ray systems market in 2016. Siemens Healthineers, Inc. looked to further strengthen its presence in the market by launching mobile X-ray systems in the market. Moreover, Shimadzu Corporation, Siemens Healthineers, Inc., Samsung Electronics Co., Ltd., Hitachi, Ltd., and Fujifilm Holdings Corporation collectively occupied nearly 49.0% of the total mobile x-ray systems market in 2016.

Figure: 3.12 Market Share Analysis for the Global Portable Imaging Solutions Market, by Mobile X-Ray Systems (2017)



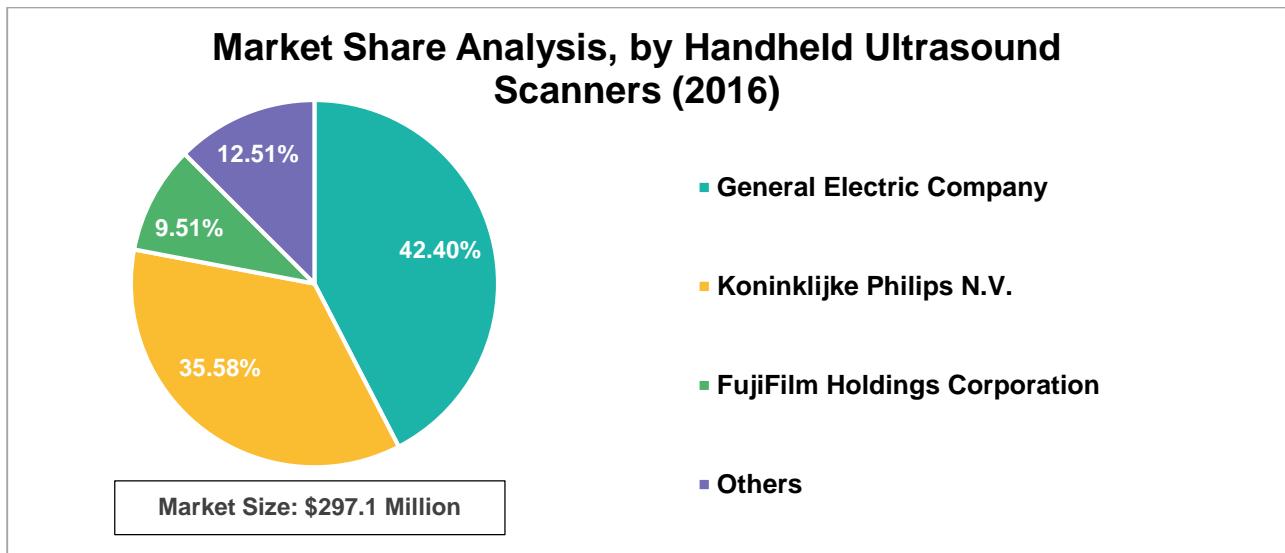
Source: BIS Research Analysis

The global mobile X-ray systems market was valued at \$607.2 million in 2017. General Electric Company dominated the global mobile X-ray systems market by holding approximately 17.59% of the market share in the year 2017. This was followed by Koninklijke Philips N.V. that occupied nearly 13.21% of the global mobile X-ray systems market. Moreover, Shimadzu Corporation, Siemens Healthineers, Inc., Samsung Electronics Co., Ltd., Hitachi, Ltd., and Fujifilm Holdings Corporation collectively occupied nearly 47.76% of the total mobile x-ray systems market in 2017. The share of other manufacturers includes Villa Sistemi Medicali Spa, Stephanix Medical Imaging Solutions, Carestream Health, Inc., and Xograph Healthcare Limited, which occupied nearly 7.66% of the global mobile X-ray systems market in 2017.



3.2.4 Market Share Analysis, by Handheld Ultrasound Scanners

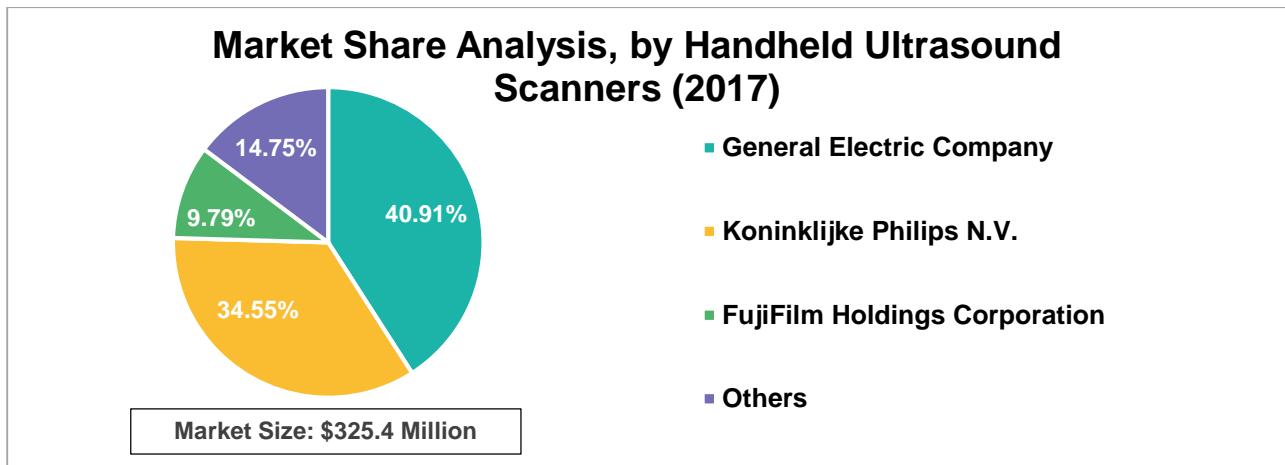
Figure: 3.13 Market Share Analysis for the Global Portable Imaging Solutions Market, by Handheld Ultrasound Scanners (2016)



Source: BIS Research Analysis

The global handheld ultrasound systems market was valued at \$297.1 million in 2016. General Electric Company dominated the global handheld ultrasound systems market by holding approximately 42.40% of the market share in the year 2016. This was followed by Koninklijke Philips N.V. that occupied nearly 35.58% of the global handheld ultrasound systems market in 2016.

Figure: 3.14 Market Share Analysis for the Global Portable Imaging Solutions Market, by Handheld Ultrasound Scanners (2017)

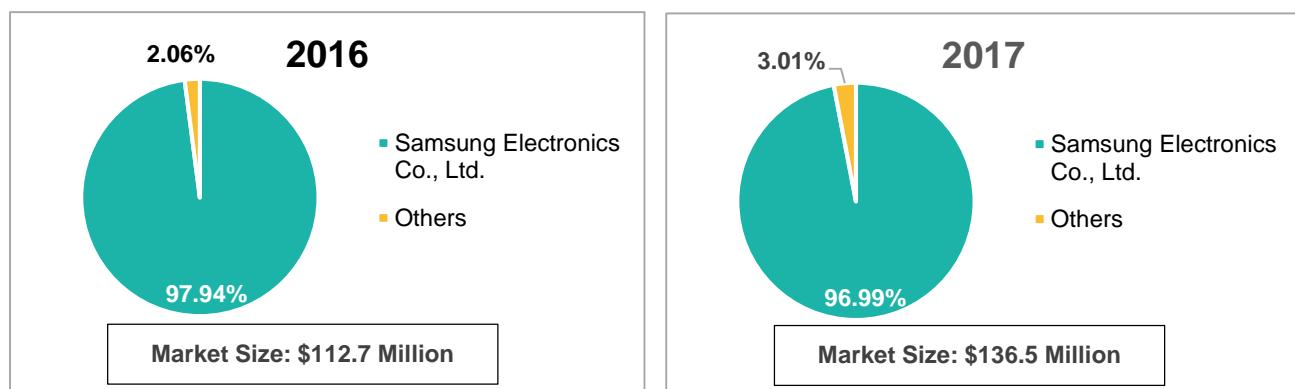


Source: BIS Research Analysis

The global handheld ultrasound systems market was valued at \$325.4 million in 2017. General Electric Company dominated the global handheld ultrasound systems market by holding approximately 40.91% of the market share in the year 2017. This was followed by Koninklijke Philips N.V. that occupied nearly 34.55% of the global handheld ultrasound systems market in 2017. The share of other manufacturers includes Clarius Mobile Health Corp., Sonoscan, EchoNous, Inc., Butterfly Network, Inc., Healcerion, Inc., and Rivanna Medical, LLC.

3.2.5 Market Share Analysis, by Portable CT Scanners

Figure: 3.15 Market Share Analysis for the Global Portable Imaging Solutions Market, by Portable CT Scanners (2016 and 2017)



Source: BIS Research Analysis

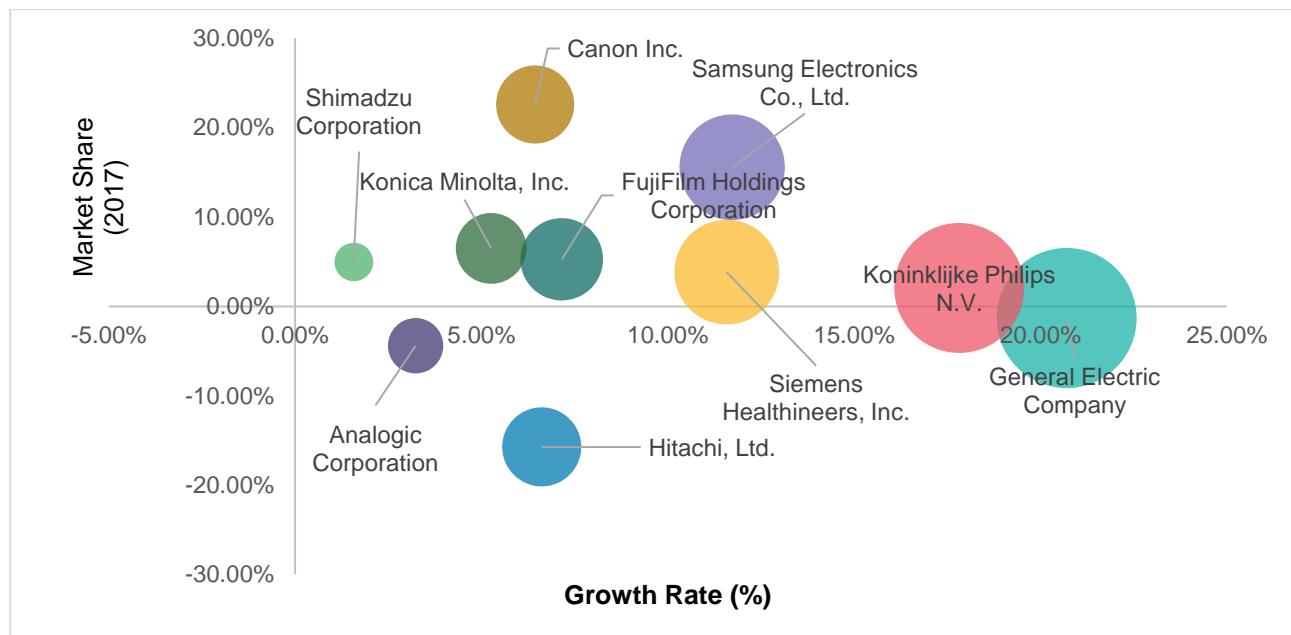
The global portable CT scanners market was valued at \$112.7 million in 2016 and \$136.5 million in 2017. Samsung Electronics Co., Ltd. held the market share of 97.94% and 96.99% in the year 2016 and 2017 respectively. The share of other manufacturers includes Xoran Technologies, LLC. Xoran Technologies, LLC offers portable CT scanners for head and neck applications whereas Samsung's portable CT scanners are used for full body scanning.

3.3 Growth Share Analysis

3.3.1 Growth Share Analysis, by Company

The global portable imaging solutions market has been dominated significantly by General Electric Company. However, due to an increased influx of funds into smaller manufacturers, the market has become extremely dynamic with a huge number of smaller companies, such as Clarius Mobile Health Corp., Healcerion, Inc., and Butterfly Network, Inc., coming up into the market and larger companies adopting strategic measures to establish their dominance. The following figure depicts the growth-share matrix for some of the major players in the global portable imaging solutions market, as per information estimated through their activities till the end of FY2017.

Figure: 3.16 Growth Share Matrix for Global Portable Imaging Solutions Market, by Company (2017)



Source: BIS Research Analysis

General Electric Company is the leader in the global portable imaging solutions market. The company accounted for an estimated 20.70% share of the global market value in 2017. The company is a premium provider of analog and digital mobile X-ray systems, handheld ultrasound scanners, and portable ultrasound scanners.

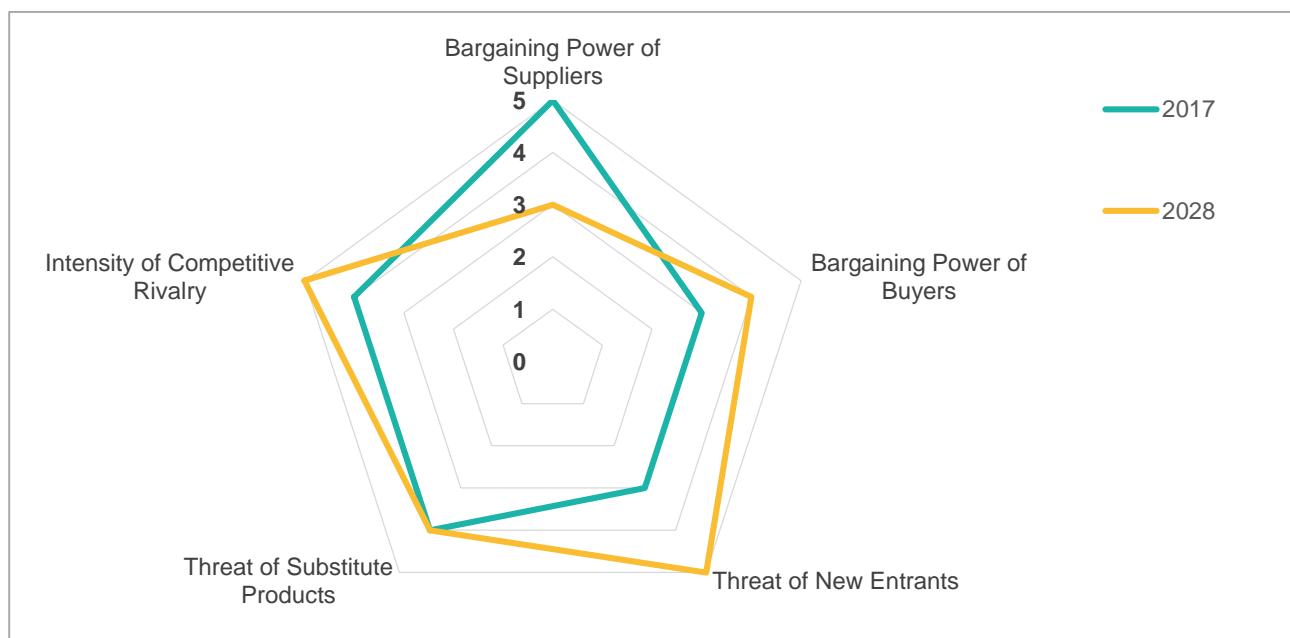
Koninklijke Philips N.V. is one of the leaders in the global portable imaging solutions market, with an estimated 17.82% share of the global market value, second only to General Electric Company. The company launched Innosight portable ultrasound system in September 2017 to sustain dominance within the market. The product is a compact diagnostic ultrasound system offering touchscreen features with high image quality and performance. Samsung Electronics Co., Ltd. held the share of 11.73% in 2017. The company entered in the medical imaging business through the acquisition of NeuroLogica Corp. in 2013.

3.4 Industry Attractiveness (Porter's Five Force Analysis)

The industry attractiveness section incorporates Porter's Five Forces analysis to determine the competitive intensity of the market. From the industry perspective, profitability can be expressed as a function of the five forces mentioned in the following figure. This framework helps any firm to understand the market, the competitors entering or leaving the market, and the firm's competitive strategy to operate in the market.

The global portable imaging solutions market is rated to be a market with a medium attractiveness. Different factors of Porter's Five Forces are analyzed by considering the entire business ecosystem, tracking the key developments made in the market in the past three years (January-2015 to September-2018). The bargaining power of suppliers is rated as low-medium and bargaining power of buyer is rated as medium. However, owing to a medium rating considered for the threat of new entrants, a medium to high rating for the threat of substitutes, and a high rating for the intensity of competitive rivalry, there is a negative impact on the overall market's rating.

Figure: 3.17 Industry Attractiveness (Porter's Five Forces Analysis)



Source: BIS Research Analysis

3.4.1 Bargaining Power of Suppliers

Supplier to Firm Concentration Ratio

The raw materials supplied for the global portable imaging solutions market majorly include ultrasound gels and components. Most of the raw materials are available from multiple vendors, and the raw material supplier concentration of the market is quite high. This can be attributed to the variability in the utilization of the same raw materials for the advancement of technologies. Hence, suppliers must lower their costs to sustain in the market competition. Thus, the impact on the industry is low.



Presence of Brands

There is hardly any criticism regarding the branding of raw materials as the marketed entity is usually the end product, i.e., diagnostic imaging modalities, whose technological efficiency is critical. Therefore, the use of branded or non-branded raw materials doesn't matter as the performance of the product entirely depends on the technology and efficiency of end product. Thus, the impact of brands is low.

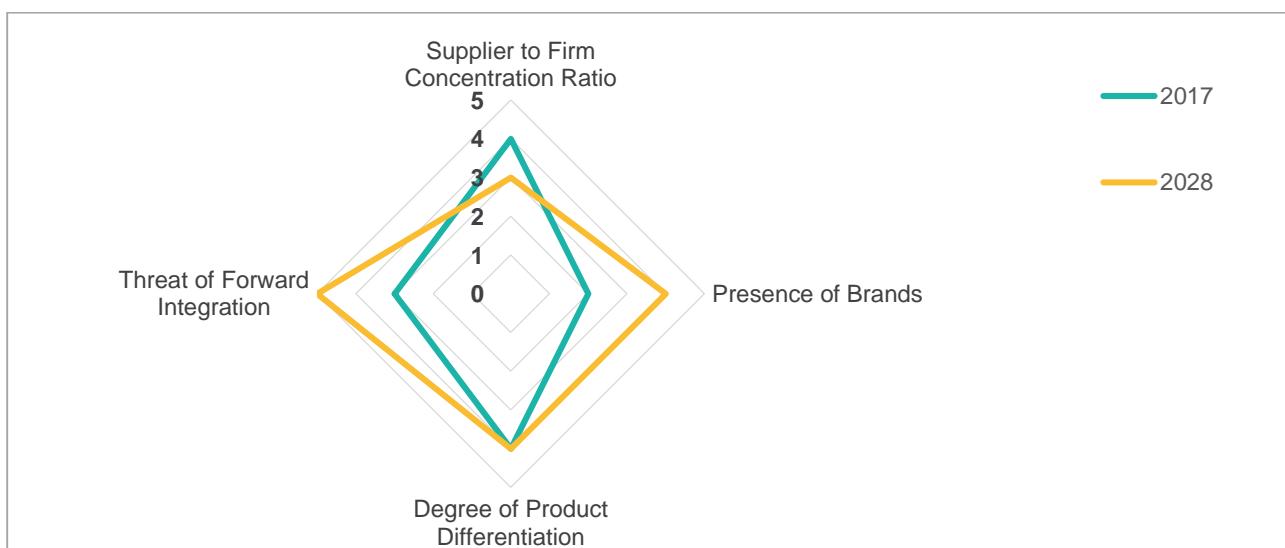
Degree of Product Differentiation

All the key players in the market are financially stable. As a result, there is no or limited compromise of the quality of raw materials. Also, the regulating bodies make it mandatory for manufacturers and raw material suppliers to adhere to the approved policies, leaving minimal scope in hampering the product quality. Therefore, the degree of product differentiation is low.

Threat of Forward Integration

The raw material suppliers in the global portable imaging solutions market have a scope of forward integration. With a significant amount of capital investment for the development of imaging modalities, the raw material manufacturers can emerge as competitors for diagnostic imaging modalities manufacturers, only if the companies are manufacturing most of the primary raw materials required for the products. Thus, the impact on the industry is high.

Figure: 3.18 Bargaining Power of Suppliers: Overall Impact



Source: BIS Research Analysis

3.4.2 Bargaining Power of Buyers

Buyer to Firm concentration ratio

The cost of diagnostic imaging modalities majorly depends on its technology and the cost of development and production. Therefore, high industry concentration does not create any significant impact on the cost reduction and is also not expected to decrease soon. Thus, the impact on the industry is low.

Presence of Substitutes

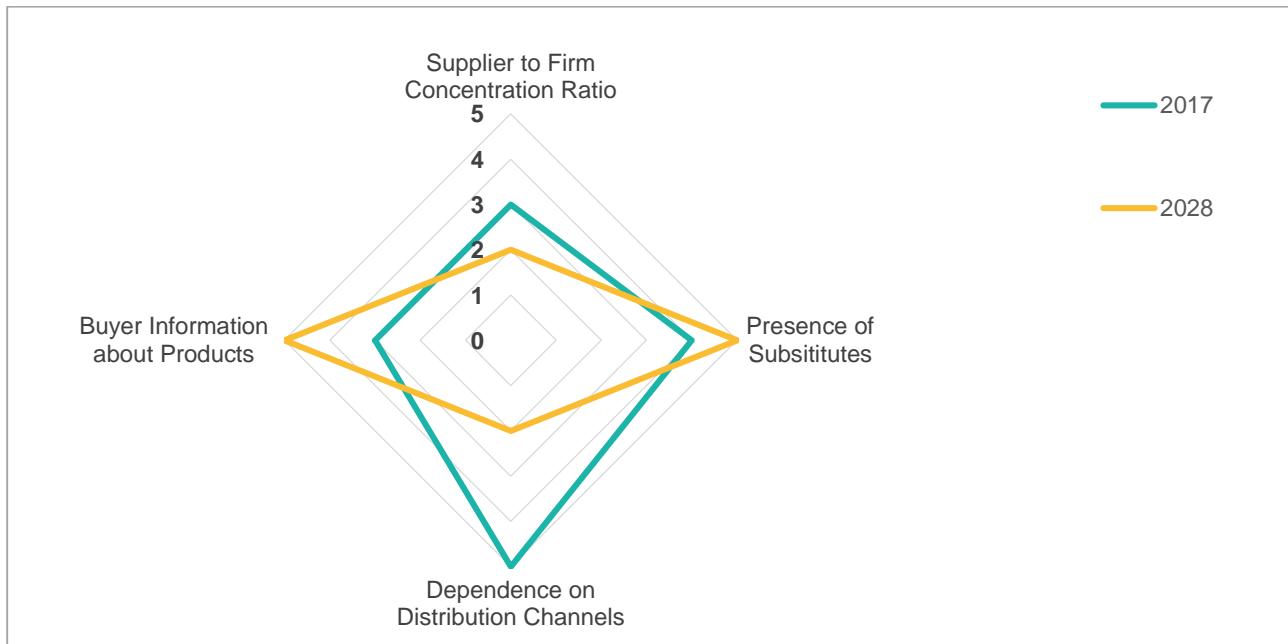
There is a significant presence of substitutes in the global portable imaging solutions market. Alternatives are majorly present in the developing regions such as Japan and China owing to the high price of the products offered by the key players. Thus, the impact of the presence of substitutes on the industry is medium to high.

Dependence on Distribution Channels

The end users of the portable imaging solutions are the hospitals, diagnostic clinics, and ambulatory surgical centers. Therefore, the manufacturers are highly dependent upon existing distribution channels to collaborate with well-established end users to promote the awareness and utilization of these portable diagnostic imaging modalities. Thus, the impact on the industry is medium to high.

Buyer Information about Products

The information about the targeted diseases and indication types offered by a company is highly important to the buyers since each disease has its requirements depending upon the indication type. Therefore, the information provided to the buyers about the capabilities and features of the product plays a vital role in the successful adoption of portable imaging modalities in the market. Thus, the impact on the industry is medium to high.

Figure: 3.19 Bargaining Power of Buyers: Overall Impact


Source: BIS Research Analysis

3.4.3 Threat of New Entrants

Rules and Regulations

At present, the regulatory scenario has been well established in most of the countries including the U.S., Japan, U.K., and Germany. The Europe region is in the process of linearizing its regulatory scenario with the U.S., promoting similar regulations for identical products. Moreover, owing to the well-defined rules placed by the respective governments, key players are expected to abide by these regulations for the swift approval of their products. Thus, the impact on the industry is high.

Brand Image

Brand image plays an essential role in the success of a product, especially for new entrants. However, there is an emerging trend for buyers to opt for brands that are lesser-known due to the cost-effectiveness that they provide, and its efficiency close to the branded ones. This trend can generally be seen in both developing and developed economies. Thus, the impact on the industry is high.

Product Differentiation

The offered products by different manufacturers are usually quite similar with minor variances in their applications and capabilities. However, most of the existing and new players in the market are trying



to build technologically advanced products, with additional features, to remain competitive in the market. Thus, the impact on the industry is low.

Capital Investments and Funding

Companies require a substantial amount of capital investment to venture into the market with a multi-purpose workstation or to upgrade to new technologies. The global portable imaging solutions market has witnessed a significant amount of funding from the investment firms or small group of investors to expand its regional research and to advance its current product offerings. Thus, the impact on the industry is medium.

Figure: 3.20 Threat of New Entrants: Overall Impact



Source: BIS Research Analysis

3.4.4 Threat of Substitutes

Buyers' Propensity toward Substitutes

Substitutes in this market usually comprise technologically advanced products, especially the ones which are currently under development or have recently been marketed. These technologically advanced products are addressed to single indication such as musculoskeletal disorders. Also, the key players are looking to incorporate higher efficiency product upgrades in their already existing product offerings. Thus, the impact on the industry is high.

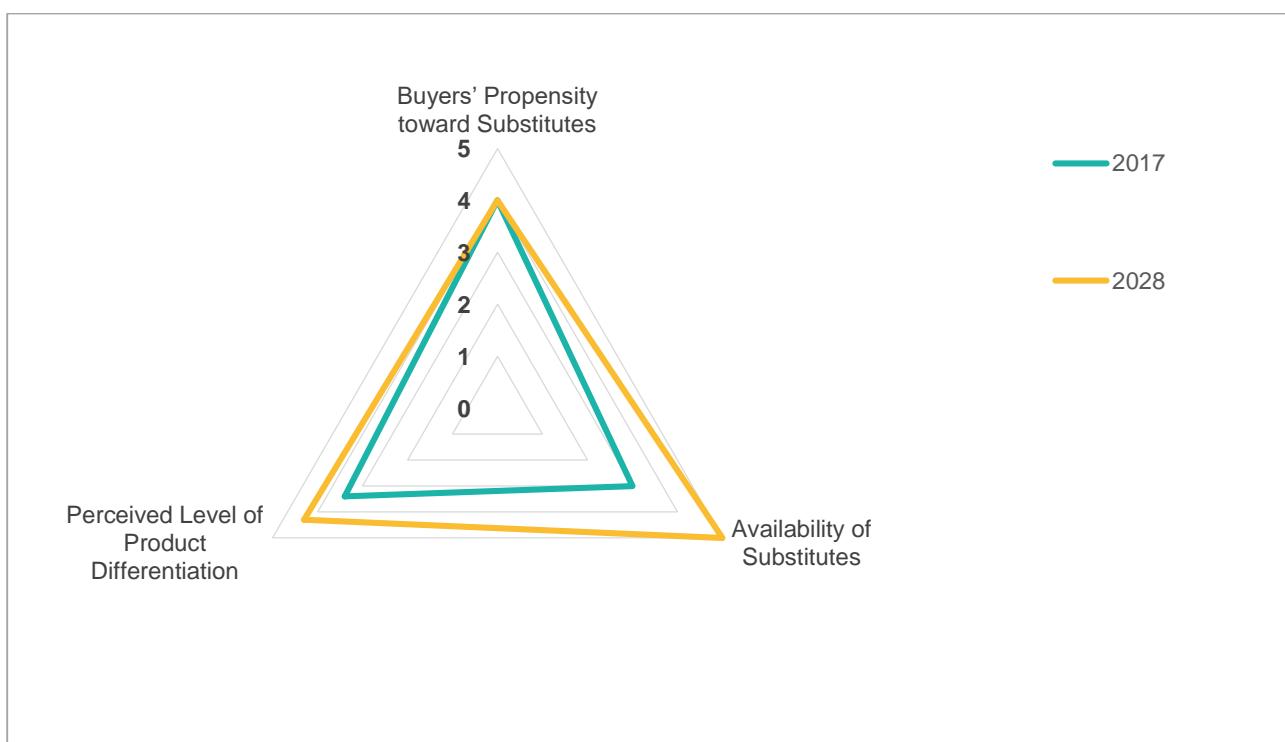
Availability of Substitutes

The substitute products for portable imaging solutions are available in the market. The advanced products with recent upgradations or advance technology are less affordable as compared to the older versions or traditional technology. However, few products which offer multiple disease indication diagnoses have lower costs than the increasing cost of different diagnostic tests of the same various disease indications. Thus, the impact on the industry is medium.

Perceived Level of Product Differentiation

Most of the diagnostic imaging products have little difference in efficiency and cost, but the requirement for a broad range of applications demands either highly specific products for each application or a single product for multiple applications. In addition to that, established medical device manufacturers are focused on developing advanced products for diverse applications. However, several end users from the developing economies are opting for affordable components with more applications. Thus, the impact on the industry is medium.

Figure: 3.21 Threat of Substitutes: Overall Impact



Source: BIS Research Analysis

3.4.5 Intensity of Competitive Rivalry

Customer's Loyalty toward the Brand Image

The global portable imaging solutions market is in its growing phase, so its end users are more attracted toward products with high popularity and brand image. This poses a severe threat to small-scale manufacturers or start-up firms to gain a significant share of the market. Thus, the impact on the industry is high.

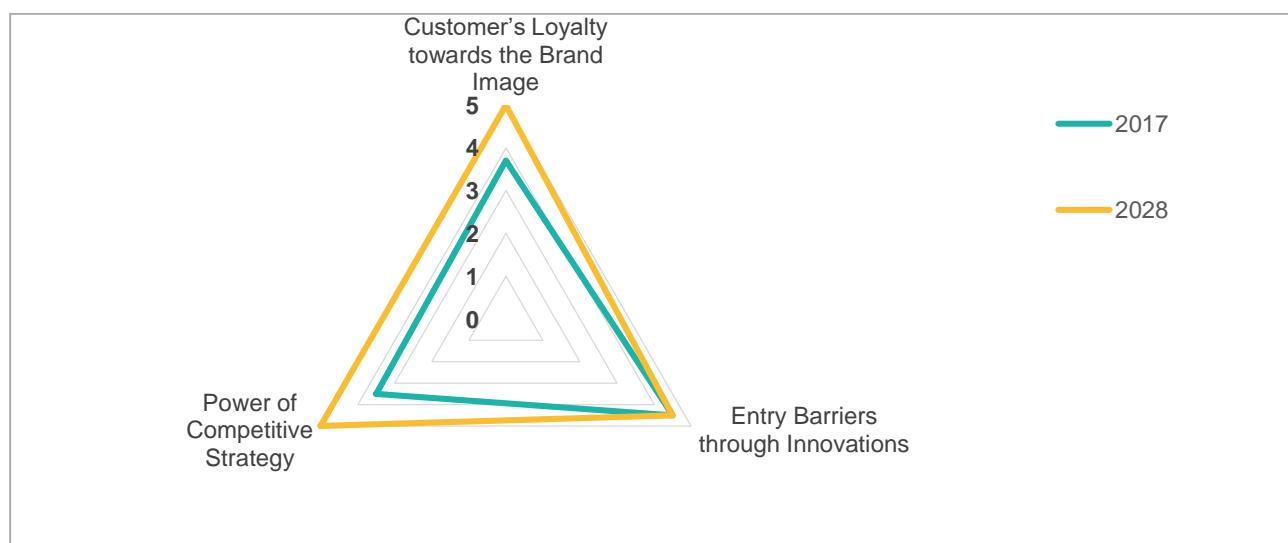
Entry Barriers through Innovations

As the market for portable imaging solutions is in its emerging stage, there are minimal barriers for small-scale manufacturers to enter in this market. The market is witnessing numerous introduction of technologically advanced products coupled with the upgradation in the existing product offerings. Moreover, there is a high demand from end users for cost-effective and efficient products; this could help the small-scale manufacturers or start-up firms to enter in the market through the unique innovation. Thus, the impact on the industry is high.

Power of Competitive Strategy

Prominent players in the market generally try to expand their global reach by employing different strategies such as partnership and distribution agreements with different players in the market. These strategies are aimed to increase their market footprints into different economies. Thus, the impact on the industry is medium.

Figure: 3.22 Intensity of Competitive Rivalry: Overall Impact



Source: BIS Research Analysis

4. Industry Insights

4.1 Regulatory Scenario

4.1.1 Regulatory Pathway for Diagnostic Imaging Systems in the U.S.

Medical diagnostic imaging modalities are classified into Class I and Class II categories of medical devices in the U.S. These systems are considered as medical devices through the Federal Food, Drug and Cosmetic (FD&C) Act. Diagnostic imaging systems are classified under the category of non – 501(k)-exempt Class I and Class II medical devices and do not follow Pre-Marketing Approval (PMA) pathway by U.S. Food and Drug Administration (FDA). In 501(k) pathways, any new diagnostic imaging devices under the Class I and Class II should be legally marketed and should have a clear definition of technological characteristics, applications, and indications.

Generally, diagnostic imaging systems are based on two different technologies to generate diagnostic results. These devices can be divided into two forms: the ones that use ionizing radiation, and the ones that do not use ionizing radiation to obtain images.

Diagnostic Imaging Modalities using Ionizing Radiation

Diagnostic imaging devices, such as mobile X-rays systems and portable CT scanners systems, are classified under this category. These devices utilize ionizing radiation to generate images known as radiographs. They are classified under the Class I and Class II medical devices. Their classification is also dependent on the type of device, such as Class I- 500(k) exempt for X-ray tube housings to Class II non-510(k)-exempt for X-ray images.

Apart from FD&C Act, the Radiation Control for Health and Safety Act of 1968 is also applicable for mobile X-ray systems, portable CT scanner systems, and other diagnostic imaging devices that emit ionizing radiation. For proper marketing in the U.S., these devices must meet the U.S. FDA standards and gain 510(k) clearances.

Diagnostic Imaging Modalities not using Ionizing Radiation

Diagnostic ultrasound imaging devices such as ultrasound are based on non-ionizing radiation technology to produce images. These devices were launched before 1976 and were regulated as Class II medical devices. Any upgradation and launch in this segment must follow the 510(k) clearances. The ultrasound modalities such as color doppler, transducers, and 3D imaging are all considered as Class II devices.

Apart from the FD&C Act, these modalities are also subjected to Radiation Control for Health and Safety Act implemented by U.S. FDA as they are ultrasound wave emitting devices.

4.1.2 Regulatory Pathway for Diagnostic Imaging Systems in the Europe

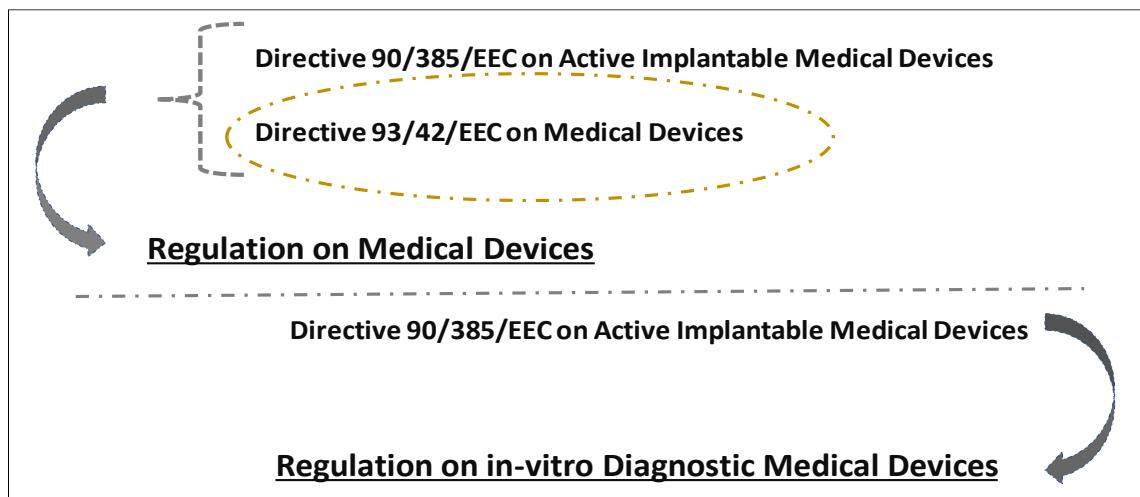
In Europe, medical devices are regulated by various laws that administrate the performance and safety of these devices across their pre-market and post-market landscape. As of 2018, the medical technology sector in European Union is translating into two new regulations, classifying In Vitro Diagnostic Medical (IVD) devices and medical devices (MD). This new legal scenario is implemented as regulations and is followed by all the 28 members of European Union.

Furthermore, the medical devices (MD) in this region are regulated by Directives 93/42/EC and 90/385/EEC. The implementation of new 2017/745/EU regulation are to be applied from May 2020. As of now, manufacturers can opt the regulation to comply with either the Regulation or the Directives. In the Medical Devices (MD) Directives, medical devices are classified into four categories namely, Class I, Class IIa, Class IIb, and Class III.

These new regulations of In-vitro diagnostics (IVDR) and Medical Devices (MDR) were published in May 2017 in the European Official Journal. This new classification is equivalently similar to the U.S. FDA medical device classification with some minor differences in category and type of the devices. These new regulations are implemented to set a high standard to evaluate medical devices with the prime objectives to enhance the quality, reliability, and safety of the medical devices.

In the Medical Devices Regulation (MDR), manufacturers must generate a clinical development plan such as Post Market Clinical Follow-up Report (PMCF), post-marketing surveillance (PMS), Periodic Safety Update Report (PSUR), and Safety and Clinical Performance (SSCP) report. Also, they must provide a clinical evaluation report to the regulatory authorities.

Figure: 4.1 Regulatory Pathway for Diagnostic Imaging Systems in Europe



Source: BIS Research Analysis

4.1.3 Regulatory Pathway for Diagnostic Imaging Modalities in the Japan

Medical devices in Japan are regulated by Pharmaceutical and Medical Device Agency (PMDA), a governing agency related to Ministry of Health, Labor and Welfare (MHLW). Both the agencies work in collaboration to ensure the safety of new products, developing rules and regulations, and monitors post-market safety.

The pathway of medical device registration involves approval, registration, and notification protocol. These processes are dependent on the classification of the medical devices, and timeline varies on the risk associated with the medical devices.

General medical devices only require notification mandatorily and do not require the approval process implemented by PDMA and MHLW. The controlled medical devices must need an approval certification from a third-party or by PDMA to market in Japan whereas specifically-controlled medical devices must be approved and reviewed by PDMA and MHLW.

The medical devices in Japan are classified into four categories:

- **Class I** (Low Risk): Medical devices in this category require only registration through Notification process.
- **Class II** (Medium Risk): Medical devices in this category must follow Approval process.
- **Class III** (Medium to High Risk)
- And **Class IV** (High Risk): These medical devices can be marketed in Japan via Approval process.

Table: 4.1 Medical Device Classification and Pre-Marketing Procedures in Japan

Classification of Medical Devices by Risk			Pre-Marketing Procedures	Application Category
Specially Controlled Medical Devices	Class IV	Risk Level: Life-threatening Risk Examples: Stents, Valves, Pacemakers	Approval by Minister	Application for manufacturing/distribution approval: New Medical Device
	Class III	Risk Level: Relatively High Examples: Radiotherapy devices, Dialyzers		Improved Medical Device Generic Medical Device
Controlled Medical Devices	Class II	Risk Level: Relatively Low	Third-Party Certification	Application for manufacturing and

		Examples: Diagnostic imaging devices, Endoscopes		distribution certification
General Medical Devices	Class I	Risk Level: Minimal Risk Examples: In-vitro diagnostic devices, dental equipment	No Approval Required	Marketing and distribution declaration

Source: *The Japan Federation of Medical Devices Associations (JFMDA) and BIS Research Analysis*

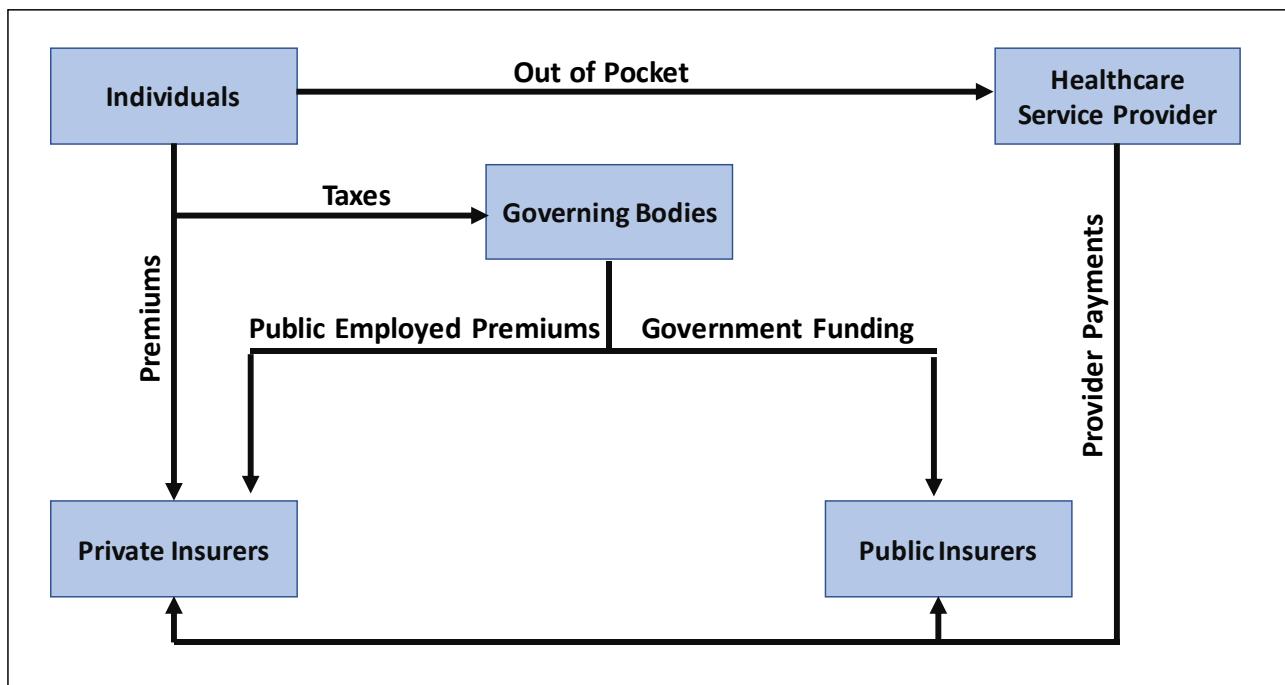
4.2 Reimbursement Scenario

4.2.1 U.S. Reimbursement Scenario

The healthcare system of the U.S. is composed of both private and public sectors, and the reimbursement system consists of several federal government organizations including Medicare, Medicaid, Veteran Affairs, and State Children's Health Insurance Plan (S-CHIP).

The Center for Devices and Radiological Health (CDRH), a part of U.S. Food and Drug Administration is solely responsible for regulating public health issues such as assuring regulation of high-quality medical devices, and safe emitting-radiation based products in the U.S. The U.S. reimbursement system is primarily governed by Centre for Medicare and Medicaid Services (CMS), consisting a mix of public and private payors.

Figure: 4.2 U.S. Reimbursement System



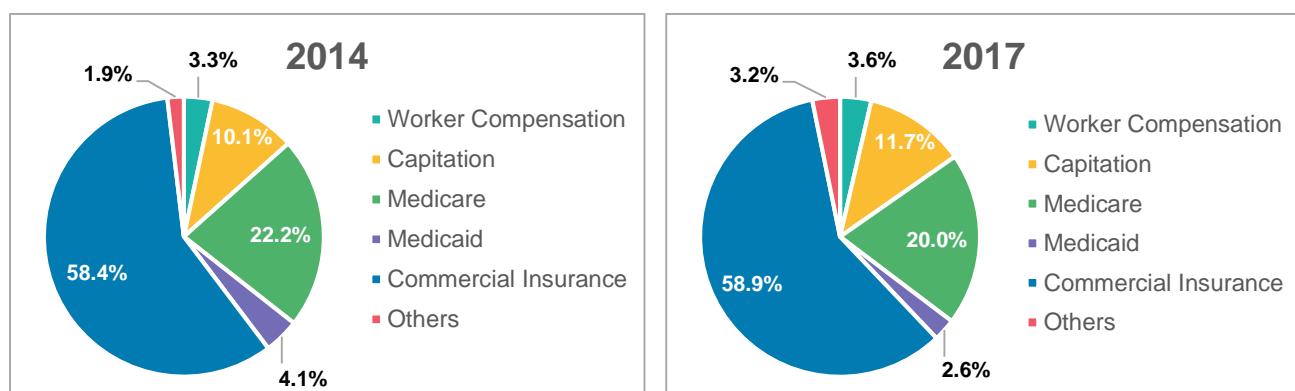
Source: *BIS Research Analysis*.

In 2017, the Centre for Medicare and Medicaid Services issued a proposal consisting of governing rules in provider payment methods and hospital outpatient facilities. The rules involved certain updates such as changes in payment methods and reimbursement coding and detailing of Medicare policies directly impacting diagnostic imaging programs.

Proposed changes include implementation of nearly 7% reimbursement penalty for services provided by computed radiography X-ray systems for both hospitals and clinics as well as creating a public access website for patients and service providers to search of procedure pricing.

CMS also aims to expand site-neutral payments and improve drug price negotiation process to reduce the Medicare cost. This proposal is expected to reduce the Medicare budget by \$500 million over the course of the year.

Figure: 4.3 U.S. Payor Mix Ratio (2014 and 2017)



Source: BIS Research Analysis

4.2.2 Europe Reimbursement Scenario

Reimbursement scenario in Europe is highly variable country-wise as each county in Europe has its own reimbursement policies being approved by either private sectors or public sectors or mixture of both.

For the proper reimbursement of diagnostic imaging tests, the diagnostic products used during the process must carry CE Mark approval. This results in complicating the reimbursement policies as they vary country by country and vary by public or private insurers.

To resolve this complication to some extent, several member countries prepared a document of medical procedures with their value of reimbursement, known as Diagnosis-Related Groups (DRGs).

In this DRGs, similar medical procedures are grouped together along with reimbursement value and codes.

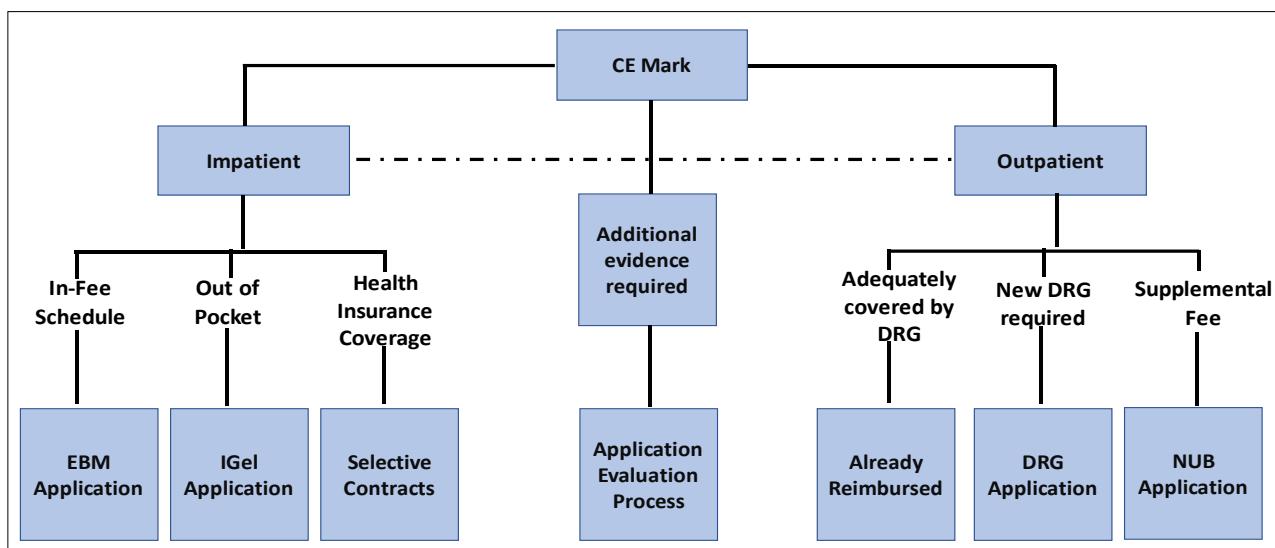
Moreover, government authorities also conduct Health Technology Assessments (HTAs) to assess cost-effectiveness of diagnostic or medical procedures and are implemented during reimbursement making decisions.

4.2.2.1 Germany Reimbursement Scenario

Reimbursement procedure in Germany is mainly operates through a dual healthcare system, namely, Statutory Health Insurance (SHI) and private health insurance. More than 90% of the population is covered with SHI and the rest is with private health insurance.

The Germany reimbursement system for medical devices are separated into two states, namely, in-patient care and out-patient care. The inpatient reimbursement system is based on Diagnosis-Related Groups (DRG) and the outpatient reimbursement system is based on Standardized Assessment Factor which regulates all billable benefits.

Figure: 4.4 Germany Reimbursement System



Source: BIS Research Analysis

4.2.2.2 The U.K. Reimbursement Scenario

Reimbursement procedure in the U.K. is governed by National Health Services (NHS) that regulates a universal health coverage in which all the citizens can use free healthcare services at the point-of-use. The services include outpatient, inpatient, ambulatory, physician, and among others.

This government authority is funded by taxation and is divided into 2 categories, namely, commissioning trusts that determines negotiation and clarifying need with the healthcare providers, and provider trusts that observe the healthcare services delivery system in the U.K.

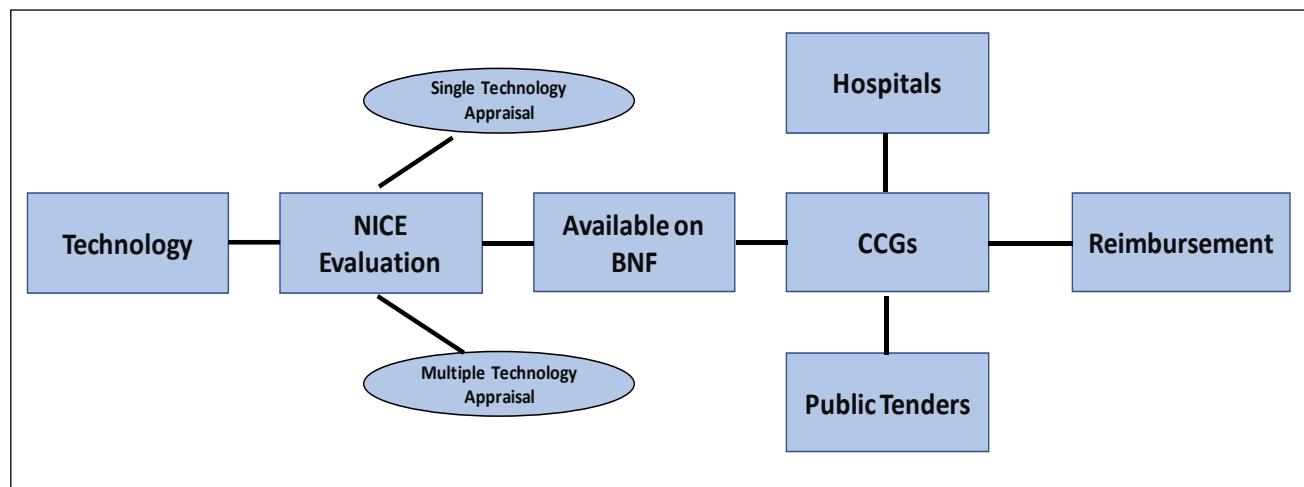
Similar to DRGs, the U.K. has its own Health Resources Groups (HRGs), which also covers all day patients. In addition, the majority of the diagnostic imaging procedures are conducted through NHS laboratories.

CCGs are clinically led statutory body of NHS, which executes healthcare services in defined area and regulates reimbursement procedure of medical devices.

The reimbursement system of NHS is dependent on factors such as:

- Hospital location
- Procedures performed under OPCS code
- Patient's diagnosis procedures by ICD codes

Figure: 4.5 The U.K. Reimbursement System



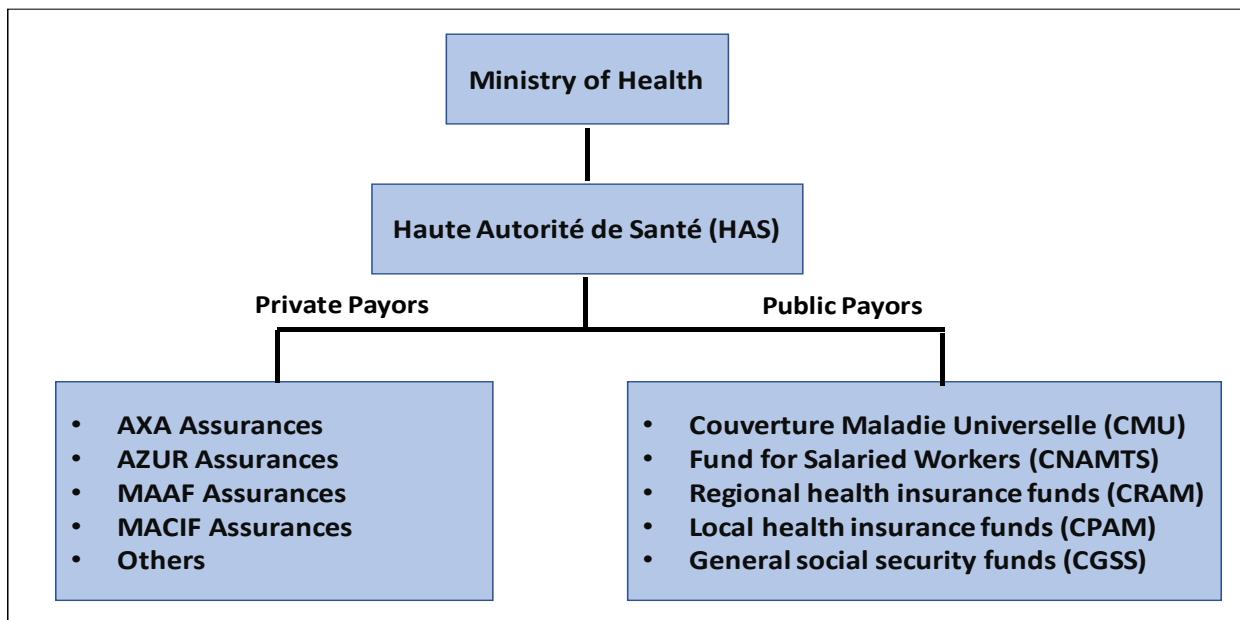
Source: BIS Research Analysis

4.2.2.3 France Reimbursement Scenario

The France reimbursement system is solely regulated by Ministry of Health, which overviews domestic healthcare system and health insurance system.

Haute Autorité de Santé (HAS) is a part of Ministry of Health, which deals with health insurance companies, healthcare professionals, patient, and health agencies, and also conducts the assessment of medical devices and drugs, guidelines publications, and certification of doctors.

Figure: 4.6 France Reimbursement System



Source: BIS Research Analysis

4.2.3 Japan Reimbursement Scenario

Japan follows a universal health insurance coverage in which all the citizens are mandated to have a health insurance. This health insurance is offered by both public and private sectors, in accordance with age and income of the citizen.

Central Social Insurance Medical Council, a public body, regulates the execution and two payer organizations (national and social insurance) to reimburse the healthcare providers, and the reimbursement structure is composed of two parts, Part A which covers hospital and consultation fees and Part B to N covers other procedures such as surgery, diagnostic imaging, treatment, and among others.

Currently, Diagnosis Procedure Combination/ Per-Diem Payment System (DPC/PDPS) which is a payment system implemented by the Ministry of Health, Labour and Welfare (MHLW) covers more than 2,309 codes. This system excludes the fee above \$90.

Table: 4.2 Japan Reimbursement System: Reimbursement Codes

Codes	Medical Practices
A	Basic Care
B	Counselling
C	Homecare
D	Laboratory Tests
E	Diagnostic Imaging
F	Medication
G	Injection
H	Rehabilitation
I	Psychiatric
J	Treatment
K	Surgery
L, M, N	Anesthesia, Radiation Therapy, and Pathology

Source: BIS Research Analysis

5. Global Portable Imaging Solutions Market (by Product Type)

5.1 Overview

Currently, the field of diagnostic imaging systems is undergoing several changes in terms of technological advancements and adoption-pattern among its end-user segment, as hospitals and diagnostic centers are becoming more reliant on the usage of advanced digital imaging technologies. The increasing demand for advanced imaging diagnosis and treatment has shaped the healthcare environment in liberating professional care providers to move forward in implementing optimum practices and technologies. The primary role of medical diagnostic imaging is to support other departments in healthcare facilities by providing treatments or diagnostics.

Diagnostic imaging is made up of a diverse range of imaging modalities including mobile X-ray units, ultrasound imaging, CT imaging, and MRI imaging, among others. In the past decade, the definition of diagnostic imaging or radiology has expanded, involving the use of these imaging modalities for point-of-care applications or other hospital departments. The ongoing trend of rising demand for diagnostic imaging and radiology treatment procedures is anticipated to continue in the future with the implementation of technological innovations and advancements in diagnostic imaging.

Also, the changing landscape of diagnostic imaging services including total patient management requires a well-planned and designed diagnostic imaging department to investigate or diagnose patients effectively and quickly as a part of the overall treatment. has resulted in the lowering the healthcare burden by improving patient's care quality.

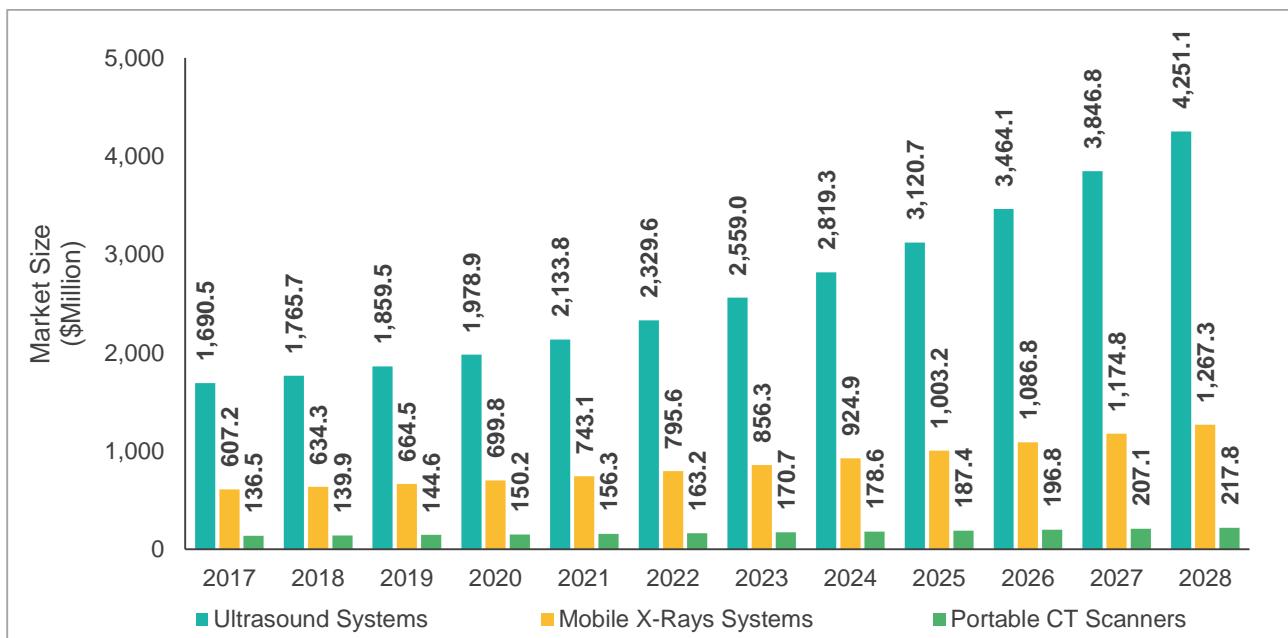
Figure: 5.1 Global Portable Imaging Solutions Market (by Product Type)



Source: BIS Research Analysis

By product type, the global portable imaging solutions market is segmented into ultrasound systems, mobile X-ray systems, and portable CT Scanners. Ultrasound systems are further segmented into portable ultrasound systems and handheld ultrasound systems. Also, mobile X-ray systems are further segmented into digital mobile X-ray systems and analog mobile X-ray systems.

Figure: 5.2 Global Portable Imaging Solutions Market (by Product Type), 2017-2028



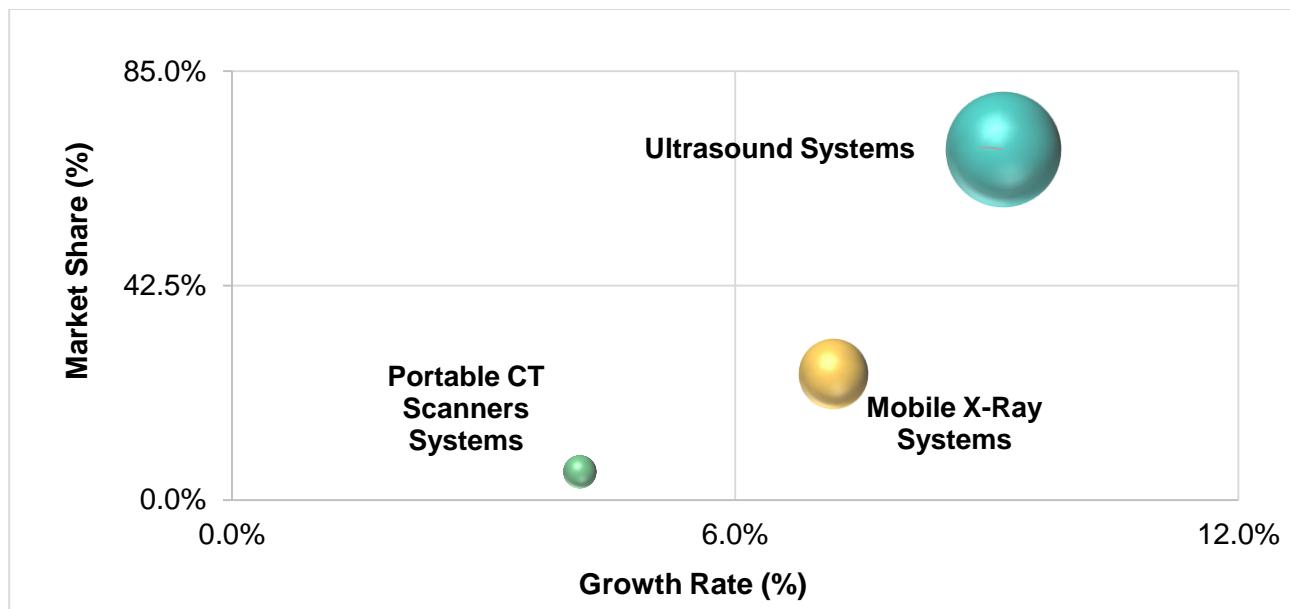
Source: BIS Research Analysis

The preceding figure depicts the global portable imaging solutions market (by product type), for 2017-2028. As of 2017, the global portable imaging solutions market by product type was dominated by ultrasound systems. This segment attributed to 69.45% of the total portable imaging solutions market (by product type) in 2017. In addition, the ultrasound segment is anticipated to be the fastest growing segment with a CAGR of 9.18% from 2018-2028, owing to the increasing adoption among radiologists for point-of-care applications and increasing ultrasound applications.

In addition to that, mobile X-ray systems segment was valued at \$607.2 million in 2017 and is estimated to grow to \$1,267.3 million in 2028 with a CAGR of 7.17% from 2018-2028, owing to its increasing adoption in hospitals for their usage in multiple clinical units. Whereas, portable CT scanners segment was valued at \$136.5 million in 2017 and is anticipated to reach \$217.8 million in 2028 with a CAGR of 4.52% from 2018-2028.

5.2 Global Portable Imaging Solutions Market (by Product Type) (Market Attractiveness Analysis)

Figure: 5.3 Market Attractiveness Analysis (by Product Type) (2018-2028)



Source: BIS Research Analysis

Ultrasound systems segment is the dominating product type segment for portable imaging solutions market. As of 2017, this segment accounted for 69.45% share of the global market size, turning in an estimated revenue of \$1,690.5 million. The preceding figure depicts the ultrasound systems segment to have a high market share and a high growth rate. These estimations indicate that the market for ultrasound systems is already replete with many marketed products addressing the respective needs and applications. This segment is growing with a healthy CAGR of 9.18% during the forecast period 2018-2028, owing to the novel advancements being made in the segment.

Mobile X-ray systems are the second-most dominating product type segment for portable imaging solutions market. As of 2017, this segment accounted for 24.94% share of the global market size, turning in an estimated revenue of \$607.2 million. This segment has become a fast-evolving segment in the global portable imaging solutions market. Various government initiatives in the developed economies regarding the use of these modalities are propelling the market growth of mobile X-ray systems. The preceding market attractiveness analysis figure depicts this segment to have a moderate market share and growth-rate among all other product type segments. These estimations indicate that the market for mobile X-ray systems is rapidly evolving and will sustain the growth with a robust CAGR of 7.17% during the forecast period 2018-2028.

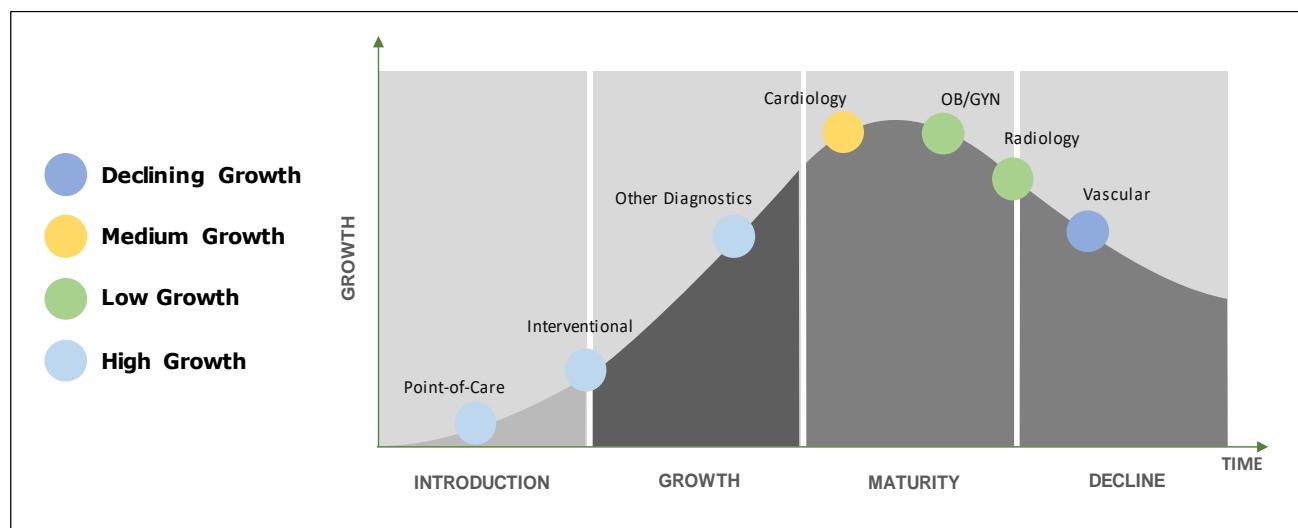
As of 2017, portable CT scanners product type segment accounted for 5.61% share of the global market size, turning in an estimated revenue of \$136.5 million. The market attractiveness analysis figure depicts this segment to have a low-moderate market share and growth-rate among all other product type segments. These estimations indicate that the market for portable CT scanners will sustain the growth of CAGR of 4.52% during the forecast period 2018-2028. Currently, there are very limited number of manufacturers in this segment.

5.3 Ultrasound Systems

Portable ultrasound systems and handheld ultrasound systems are versatile diagnostic imaging modalities and perfectly suitable for smaller diagnostic clinics and point-of-care purposes. These systems can be used for various applications such as cardiology, vascular, gynecology, and endocrinology, among others. Ultrasound systems offer the non-invasive procedure to diagnose myriad conditions involving swelling, pain, and infection. Ultrasound systems utilize non-ionizing radiations in the form of frequency sound wave ranging from 3.5 MHz to 20 MHz. Simplicity, speed, accuracy and minimal risk associated with the ultrasound procedure makes it the first-line diagnostic treatment.

With the rapidly evolving ultrasound technologies and techniques, these modalities are becoming more capable as the number of clinical areas being examined by the ultrasound systems is increasing quickly. Handheld ultrasound systems have emerged as a vital assessment tool for point-of-care, emergency and general practice applications. The difference between portable and handheld ultrasound systems is the size. In general, portable ultrasound systems weigh between 10 to 14 pounds, whereas, handheld ultrasound systems weigh between 5 to 8 pounds.

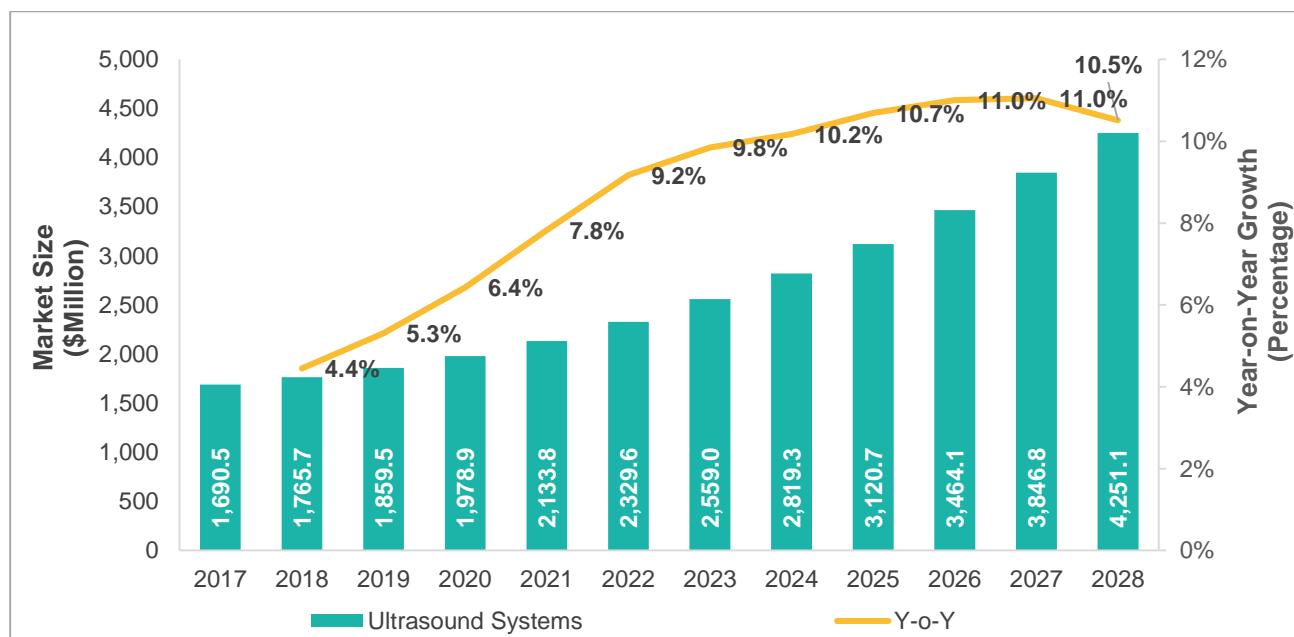
Figure: 5.4 Growth Potential of Ultrasound Systems in Different Applications



Source: BIS Research Analysis

The preceding figure depicts the growth potential of ultrasound systems in different applications. The application segment within the ultrasound systems offers variable levels of growth. Applications such as point-of-care, interventional, and other diagnostic applications are in the high growth phase of more than 10.0%. Radiology and obstetrician-gynecologic applications are in the low growth phase of less than 5.0%. Vascular applications are in the decline phase whereas cardiovascular applications offer medium growth phase ranging between 5.0%-10.0%.

Figure: 5.5 Global Portable Imaging Solutions Market (by Ultrasound Systems), 2017-2028

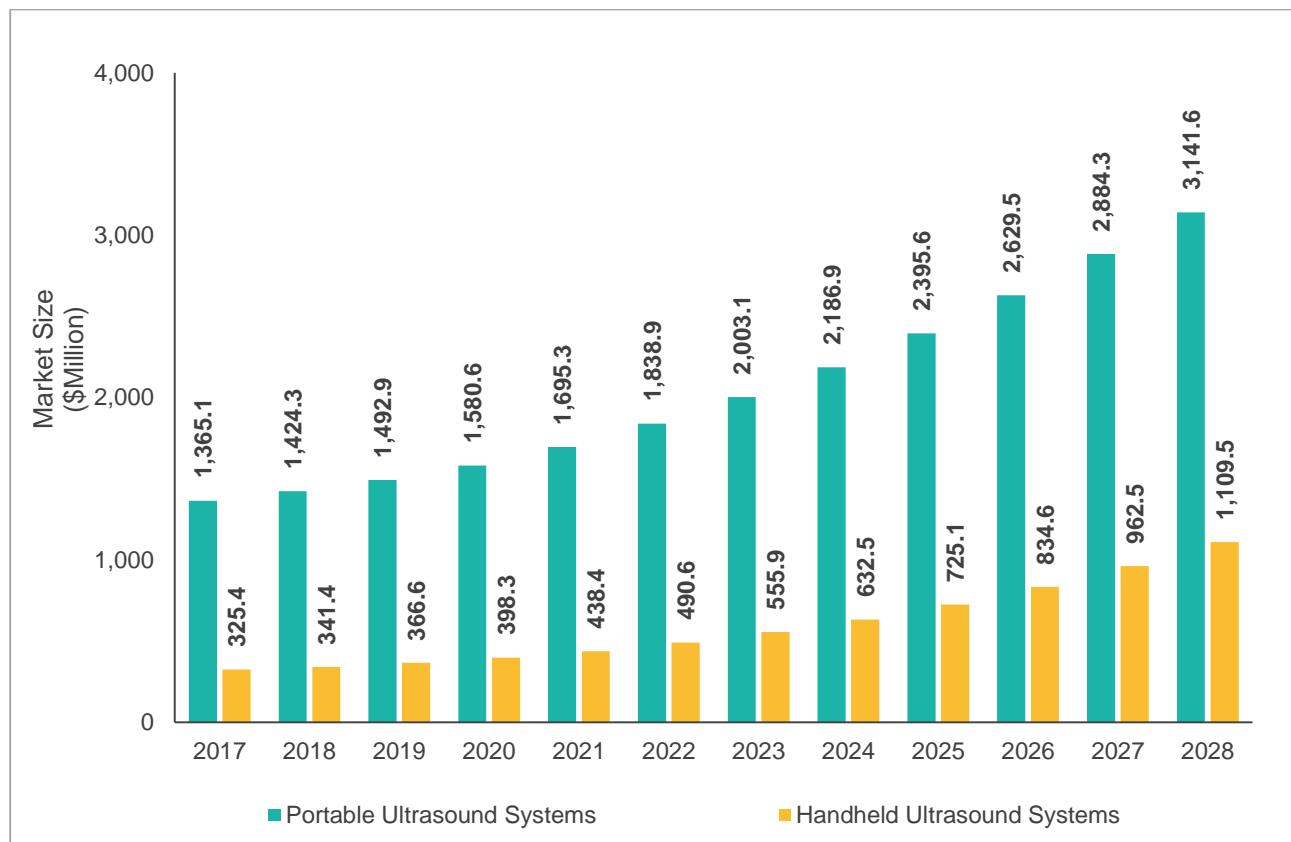


Source: BIS Research Analysis

The preceding figure depicts the global portable imaging solutions market (by ultrasound systems), for 2017-2028. The ultrasound segment of the global portable imaging solutions market was valued at \$1,690.5 million in 2017 and is anticipated to reach \$4,251.1 million by end 2028, growing at a CAGR of 9.18% during the forecast period 2018-2028. The ultrasound systems are the fastest growing segment in the global portable imaging solutions market, owing to the increase in the usage of these modalities for a wide range of diagnostic applications as compared with other imaging modalities. Moreover, owing to the fact that unlike other diagnostic imaging techniques, ultrasound systems emit no radiation, they are the most preferred techniques used by radiologists for obstetrics and gynecology applications.

5.3.1 Ultrasound Systems (by Product Type)

Figure: 5.6 Global Portable Imaging Solutions Market (by Portable Ultrasound Systems and Handheld Ultrasound Systems), 2017-2028



Source: BIS Research Analysis

The preceding figure depicts the global portable imaging solutions market (by portable ultrasound systems and handheld ultrasound systems), for 2017-2028. The ultrasound segment within the global portable imaging solutions market is further sub-segmented into portable ultrasound systems and handheld ultrasound systems, based on the size and portability of the product.

The portable ultrasound systems market was estimated to have a value of \$1,365.1 million, in 2017. The market is expected to grow at a CAGR of 8.23% during the forecast period 2018-2028 and attain a value of \$3,141.6 million by 2028. Handheld ultrasound systems segment was estimated to be valued at \$325.4 million in 2017. It is anticipated to grow at the fastest rate within the ultrasound systems segment while attaining a CAGR of 12.51% during the forecast period 2018-2028.

The market is witnessing robust demand for ultrasound systems which are portable and compact, owing to the increasing point-of-care trend in the developed economies. Also, various government initiatives in the underdeveloped economies such as Africa, are also using these portable imaging systems for home-to-home diagnostics in the rural areas.

The shifting healthcare landscape from volume-based model to the value-based model is also driving the market growth of ultrasound systems, as these systems can be used inter-department within a single hospital unit and thus reducing the procurement cost of the hospitals.

5.3.2 Emerging Competition within the Ultrasound Systems Market

The introduction of handheld ultrasound systems has dramatically changed the landscape of the diagnostic imaging market. The increasing adoption of these systems by various end-users for quick assessment and evaluation for emergency and general practices is anticipated to change the market scenario in the near future. The competition within this market is growing intensely as a large number of start-ups have come into existence, each with novel ideas of targeting newer applications.

This sudden rise in the number of companies was ably supported by the increase in funding opportunities from leading venture capitalists, providing highly advancing clinical studies. The products introduced by these companies are based on advanced technologies and are targeted into the niche market which holds lucrative opportunities to gain sufficient traction in the market share. Some of the emerging start-ups are Clarius Mobile Health Corp., Butterfly Network, Inc., Healcerion, Inc., EchoNous, Inc., Teratech Corporation, Sonoscan, eZono AG, BURL Concepts, Inc., and Rivanna Medical, LLC.

The market for portable ultrasound systems is in its early maturation phase offering a very limited scope in the market growth. Thus, the manufacturers are shifting their focus to handheld ultrasound systems by targeting the point-of-care market. Point-of-care market refers to several emerging markets, such as anesthesiology, emergency medicine, musculoskeletal, and critical care medicine, among others. All these emerging markets are impelling the growth of handheld ultrasound systems.

5.3.3 Key Strategies adopted by Manufacturers in the Ultrasound Systems Market

The manufacturers of ultrasound systems are adopting several different strategies to gain significant traction in the market share. The players are more focused on introducing technologically advanced products in the market. The increased competition by start-up companies and public companies have changed the dynamics of the market as these newly introduced products have high product differentiation in terms of minimization, and implementation of Artificial Intelligence. From 2015-2018, the ultrasound market has witnessed 21 product launches by the key players. For instance,

- In 2017, Clarius Mobile Health Corp. launched two additional accessories for its handheld ultrasound systems. Through these accessories, scanners can be used for different applications by offering advanced features such as color/power doppler, partial compounding, and needle enhancement techniques.
- In January 2017, General Electric Company launched the Vscan Extend Handheld Ultrasound System, offering wireless connectivity and enhanced image quality. This system is intended for use both in hospitals and point-of-care applications.

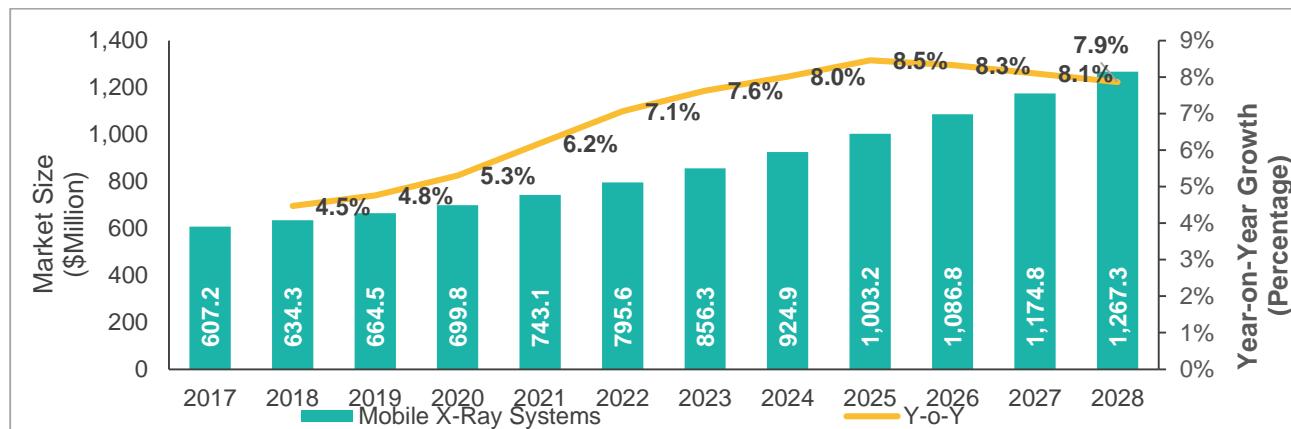
Apart from product launches, the start-up companies are also focused on increasing their regional footprints, by following partnership and distribution agreements with distributors or resellers in different regions. For instance,

- In 2017, Clarius Mobile Health Corp. signed two distribution agreements, one with Arthrex, Inc. to distribute Clarius's ultrasound scanners for musculoskeletal (MSK) application under the brand name of Synergy MSK Ultrasound, and other with North American Rescue, LLC to sell their products to military and federal agencies.

5.4 Mobile X-Ray Systems

The rapidly evolving healthcare industry has led hospitals and other healthcare providers to become more adaptable to the advanced technologies. Changes in payment methods and technologies are altering treatment delivery model, by delivering high quality of care and also, by maintaining balanced influx and outflux of patients, especially in radiology. This would mean a rise in the patient throughput coupled with a faster delivery of the imaging results. These factors have resulted in the rise of mobile X-ray systems, by providing assistance in streamline operations throughout the medical facility.

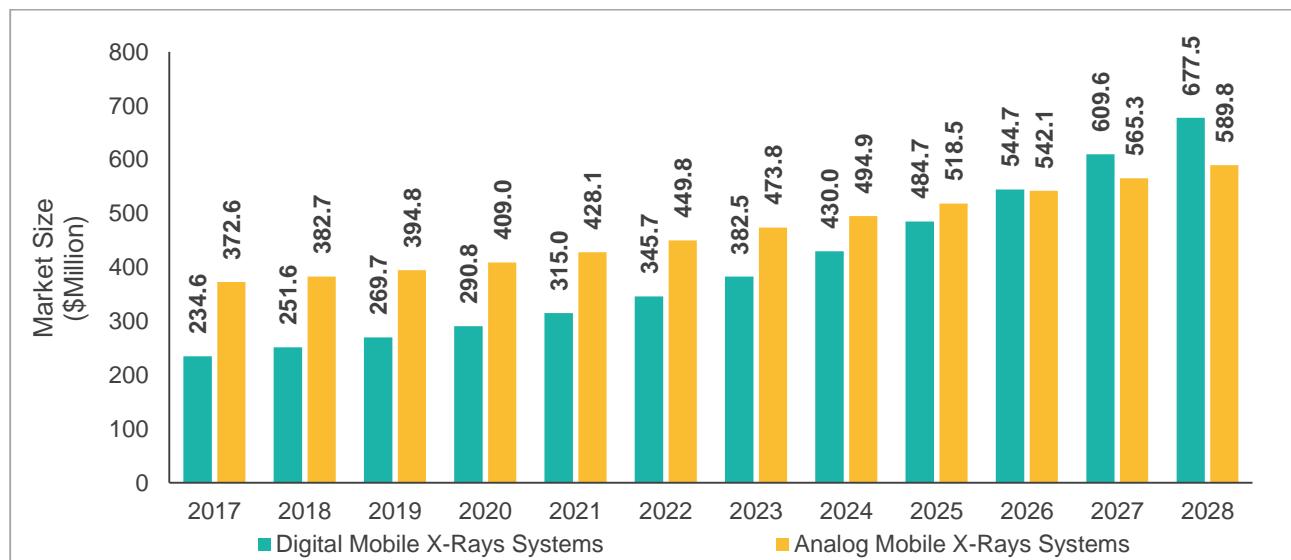
Mobile X-ray systems are adopted for radiographic imaging of paraplegics or critical patients who are unable to physically reach over to the radiology department and for patients who are in the intense care units (ICUs) and critical care units, or operating rooms that lack fixed or standard radiographic equipment. These systems are used for general medical applications such as general imaging, pediatric, skeletal, and abdominal imaging, among others. Currently, there are several types and variations of the products available in the market. Some of them are supported with battery powered units and some function without them.

Figure: 5.7 Global Portable Imaging Solutions Market (by Mobile X-Ray Systems), 2017-2028


Source: BIS Research Analysis

The preceding figure depicts the global portable imaging solutions market (by mobile X-ray systems), for 2017-2028. The mobile X-ray systems segment of the global portable imaging solutions market was valued at \$607.2 million in 2017 and is anticipated to reach \$1,267.3 million by 2028, growing at a CAGR of 7.17% during the forecast period of 2018-2028. These systems are ideal for use in small hospitals and other healthcare facilities

5.4.1 Mobile X-Ray Systems (by Product Type)

Figure: 5.8 Global Portable Imaging Solutions Market (by Analog Mobile X-Ray Systems and Digital Mobile X-Ray Systems), 2017-2028


Source: BIS Research Analysis

The preceding figure depicts the global portable imaging solutions market (by analog mobile X-ray systems and digital mobile X-ray systems), for 2017-2028. The mobile X-ray systems segment within the global portable imaging solutions market is further sub-segmented into digital mobile X-ray systems and analog mobile X-ray systems, based on the imaging technology.

The analog mobile X-ray systems market was estimated to have a value of \$372.6 million, in 2017. The market is expected to grow at a CAGR of 4.42% during the forecast period 2018-2028 and attain a value of \$589.8 million by 2028. The digital mobile X-ray systems market was estimated to be valued at \$234.6 million in 2017 and is anticipated to grow at the fastest rate within the mobile X-ray systems segment attaining a CAGR of 10.41% during the forecast period 2018-2028.

The mobile X-ray systems market has witnessed various technological advancements which have resulted in a shift in the adoption pattern of these systems from analog to digital systems by multiple end-users. Digital mobile X-ray systems are efficient, productive, cost saving, and patient-centric. These provide a value-based imaging procedure, offer a reduced scan time and an improved image quality, all of which are the driving factors for the digital mobile X-ray systems market.

Digital mobile X-ray systems are advantageous when compared with analog mobile X-ray systems, as digital mobile X-ray systems do not use X-ray films or cassettes; images can be directly displayed after capture, and can be transferred into Picture Archiving and Communication System (PACS) for achieving interpretation, and distributions. Moreover, these systems also address the increasing concern of radiation doses given to staff and patients as they can enhance image quality after acquisition, enabling the radiologist to deliver low radiation doses while maintaining high image quality. The advantages offered by digital mobile X-ray systems may lead to the complete replacement of the analog mobile X-ray systems in the upcoming years.

5.4.2 Changing X-Ray Differential Payment Policy (U.S.)

The U.S. government is focused on upgrading its patient safety and clinical effectiveness, by enacting its second policy designed to implement advanced technologies in installed imaging systems in the U.S. In December 2016, the government has passed “Consolidated Appropriations Act of 2016”. This Act emphasizes healthcare providers to convert cassette-based radiography systems (CR) into full digital systems.

For this, in January 2017, Centers for Medicare & Medicaid Services (CMS) have imposed nearly 20% reimbursement penalty to medical providers who perform X-ray procedure on film-based systems and in January 2018, CMS also imposed 7% of penalty to medical providers who perform X-ray procedure using Computed Radiography (CR) systems. It is estimated that the penalty will increase to more than 10% by January 2023. As of now (2018), nearly 55.49% of medical providers

are using CR systems while the remaining 44.51% are shifting to digital X-ray systems in North America.

This new law implementation is anticipated to change the dynamics of the mobile X-ray systems in the near future, by replacing analog systems to fully digital units, also because of inclination towards digitization of Electric Health Record (EHR) in the U.S.

5.4.3 Key Strategies adopted by Manufacturers in the Mobile X-Ray Systems Market

The advent of digital mobile X-ray systems has changed the competitive landscape of mobile X-ray systems market. The players of mobile X-ray systems are more focused on designing and manufacturing technologically advanced products. By tracking the product launches in the mobile X-ray systems market, it has been observed that most of the systems launched were digital mobile X-ray systems.

From 2015-2018, the mobile X-ray systems market has witnessed 12 product launches by the key players. For instance,

- Shimadzu Corporation has consistently been launching mobile X-ray systems for the last three years. The company launched MobileDaRt Evolution EFX Mobile X-rays system, MobileDaRt Evolution MX7 Version Mobile X-rays system, and MobileDaRt Evolution MX8 Version Mobile X-rays system in 2015, 2016, and 2017 respectively.
- In October 2016, Carestream Health launched the DRX-Revolution Nano mobile X-ray system. The system is a non-motorized system based on carbon nanotube technology which helps in reduction of the size and weight of the product.
- In July 2016, Canon, Inc. launched the RadPRO 1 Mobile 40kW FLEX PLUS mobile digital X-ray system. The system offers customization of workflow pattern along with eliminating unnecessary steps which were required earlier during the procedure.

Apart from product launches, a few distribution and partnership agreements are also being witnessed in the mobile X-ray systems market. For instance,

- In September 2017, Carestream Health signed an agreement with Med Imaging Healthcare, Scotland. Under this agreement, Carestream will offer preventive maintenance and repair services in the country, whereas, Med Imaging Healthcare will support unplanned maintenance and repair services. This enables the company to offer wider coverage and support for its DRX Evolution Plus and DRX Revolution digital mobile x-ray systems.

5.5 Portable CT Scanners

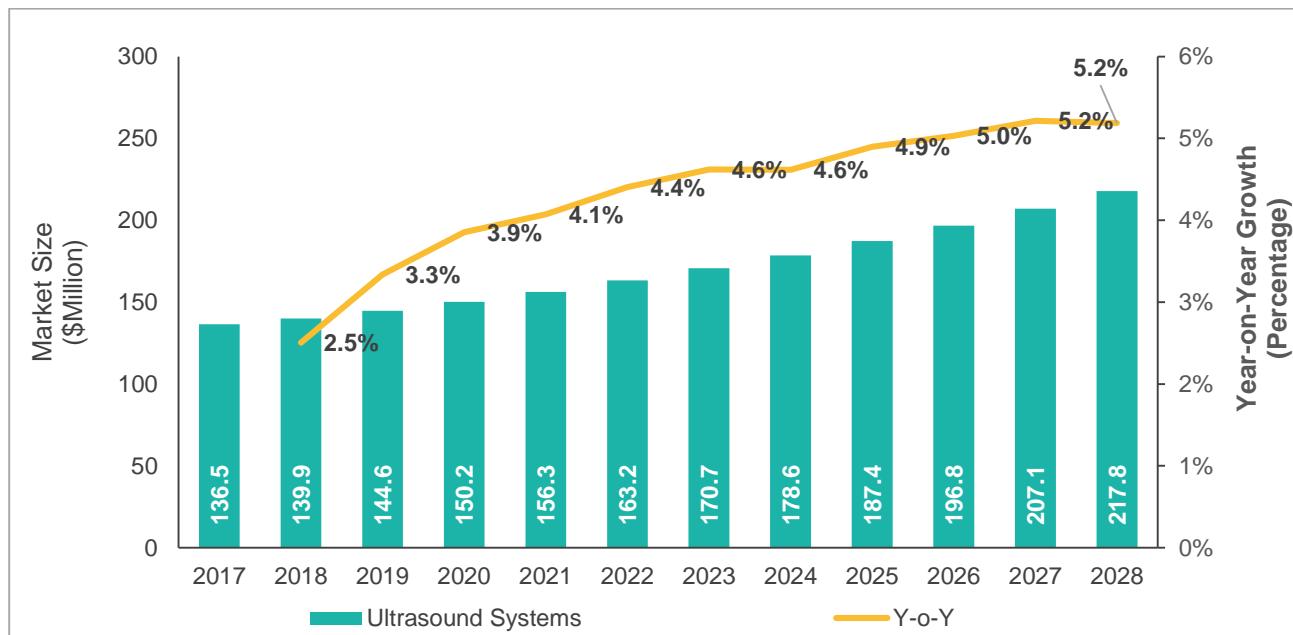
Portable Computed Tomography (CT) Scanners are the medical diagnostic imaging modalities that utilize X-ray technology to generate cross-sectional images (slices) of various anatomical structures. These systems are compact, mobile, and battery-powered or mains-powered units and can be used in support of critical care, minimizing the movement of critically ill patients, and in operating units, where it may be utilized to provide a rapid check on the outcomes of surgical procedures. The primary benefit of these systems is its ability to scan the patients at their bedside rather than having to move that patient to the diagnostic imaging department. Several healthcare facilities are installing these systems in a suite connected to the Intensive Care Units (ICUs). This is expected to improve the patient care in ICUs, by avoiding the risk of transport. This form of patient care also provides economic benefit.

Currently, Samsung Electronics Co., Ltd. is the only leader in the portable CT scanners market. The company offers three systems, i.e., BodyTom, OmniTom, and CereTom. BodyTom is a full body, battery powered, 32-slice CT scanner that offers 85 cm gantry and 60 cm field view. The system is compatible with EHR systems, PACS, planning systems, robotic surgical systems, and navigation systems. OmniTom is a 16-slice CT scanner that offers angiography, non-contrast, and perfusion scans. This point-of-care tool also aids in collecting real-time data on critically ill patients. CereTom is an 8-slice CT scanner that provides CT angiography, non-contrast CT, and CT perfusion scans.

Table: 5.1 Multi-Departmental Use of Portable CT Scanners (Samsung Electronics Co., Ltd.)

BodyTom	OmniTom	CereTom
Orthopedic Surgery	Intensive Care Units	Intensive Care Units
Neurosurgery	Operating Room	Operating Room
Emergency Department	Emergency Department	Emergency Department
Spine Surgery	Neuro IR Suite	Neuro IR Suite
Trauma Surgery	Patient Rooms	Mobile Stroke Unit
Critical Care	Radiology Department	Patient Rooms
Radiology	Neurology Office	Radiology Department
Radiation Oncology	Maxillofacial Surgical Suite	Neurology Office
Interventional Radiology		Maxillofacial Surgical Suite

Source: BIS Research Analysis

Figure: 5.9 Global Portable Imaging Solutions Market (by Portable CT Scanners), 2017-2028


Source: BIS Research Analysis

The preceding figure depicts the global portable imaging solutions market (by portable CT scanners), for 2017-2028. The portable CT scanners segment of the global portable imaging solutions market was valued at \$136.5 million in 2017 and is anticipated to reach \$217.8 million by end 2028, growing at a CAGR of 4.14% during the forecast period 2018-2028. This growth is attributed to its role in the management of patients in critical care units and improving patient care. These systems are advantageous as they allow imaging to be conducted in the operation theatres, minimizing the need to transport patients to conventional fixed CT scanners.

Portable CT scanners also acquire images of soft tissues, bones, and tumors in the exact operative position and are adapted for making critical decisions during the surgeries. These systems are the combination of speed, versatility, and portability which makes them a highly cost-effective solution. They are utilized for a broad range of applications, including spinal, cranial, head & neck, trauma, vascular surgery, orthopedic, and ear, nose, & throat (ENT).

The evolution of CT scanners from fixed systems to portable systems is a ground-breaking technology, by providing patients a high quality of care by improving patient safety and enhancing surgical outcomes, and as such the widespread use of these systems will become the norm rather than the exception.

Additionally, these systems are capable of taking additional scan during the surgeries, prior to closure, which helps the surgeons to confirm placement of devices or removal of the pathology to exclude complications and eliminates the need for any re-operation.

5.5.1 Comparison between Samsung's CereTom and Xoran's Xcat Portable CT Scanners

Specifications	Samsung's CereTom	Xoran's Xcat
Physical Dimensions	60 inches × 52 inches × 28 inches	32 inches × 47 inches × 60 inches
Effective Bore Size	12.5 inches	16 inches
Weight	362 Kilograms	236 Kilograms
Technology	8-slice multi-sectional CT Scanner	Cone-Beam CT Scanner
Detector	Eight 125-mm wide detectors	Single Volumetric Flat Panel
Scanning Parameters	140 kV, 7 mA	120 kV, 6 mA
Scan Time	2–6 Rotation/Second	20 Seconds
Radiation Dose	In head CT mode	In typical sinus CT
Absorbed Dose (mGy)	24.7	9.7
Effective Dose (mSv)	1	0.41

Source: BIS Research Analysis

5.5.2 Investment Opportunities within the Portable CT Scanners Market

Currently, there exist only a few manufacturers in the portable CT scanners market. Samsung Electronics Co., Ltd. (Samsung) is the only premium provider of these systems, holding more than 97.0% of the total market. With the acquisition of NeuroLogica Corporation in 2013, Samsung Electronics Co., Ltd. expanded their product offerings in medical imaging diagnostics market. Apart of Samsung, rest of the market share (3.0%) is captured by Xoran Technologies, LLC (Xoran), which manufacturers xCAT portable CT Scanners for head scanning applications.

The market encompasses enormous investment opportunities considering its increasing role in minimally invasive surgical approaches. The concepts such as hybrid operating room will significantly combine the surgery as well as the intra-operative imaging systems. Hence, these portable modalities are well positioned to replace conventional open surgeries with minimally invasive surgeries (MIS). The diagnosis of neurological problems (due to emergency nature) also stands as one of the major

future applications for these modalities. These low cost, high performance imaging systems can significantly reduce the “reach out to patient” time and the risks of transporting critically ill patients.

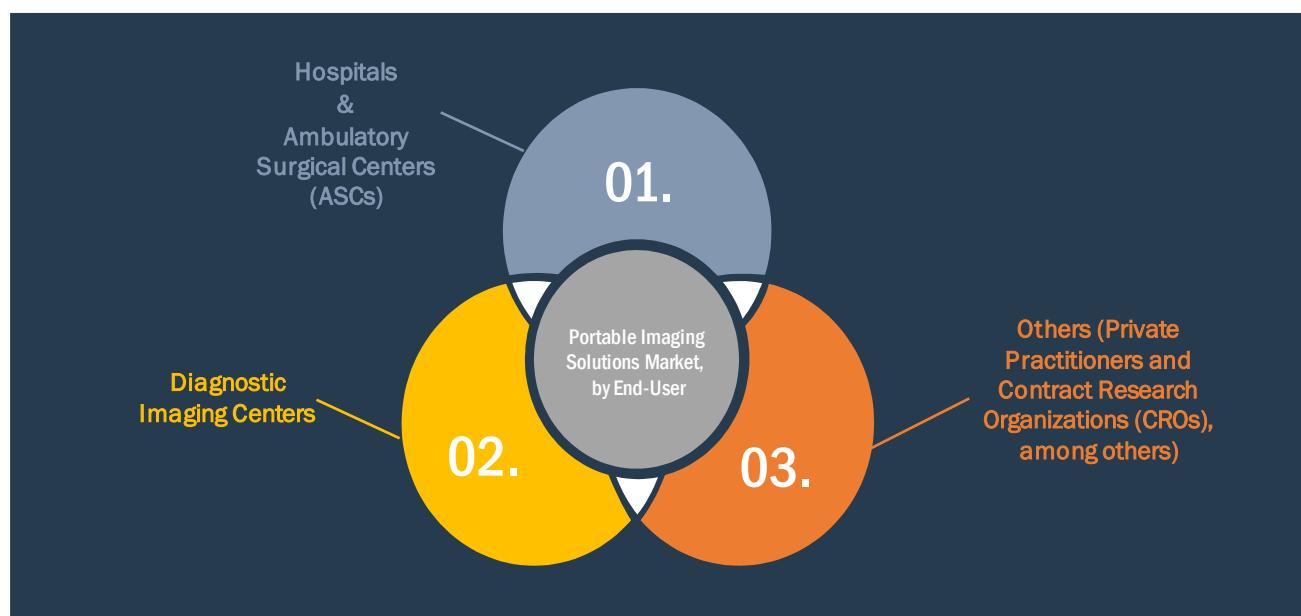
However, factors such as uncertain reimbursement scenario across developing countries, dearth of well trained and skilled healthcare professionals continue to adversely affect the portable CT scanners market.

6. Global Portable Imaging Solutions Market (by End-User)

6.1 Overview

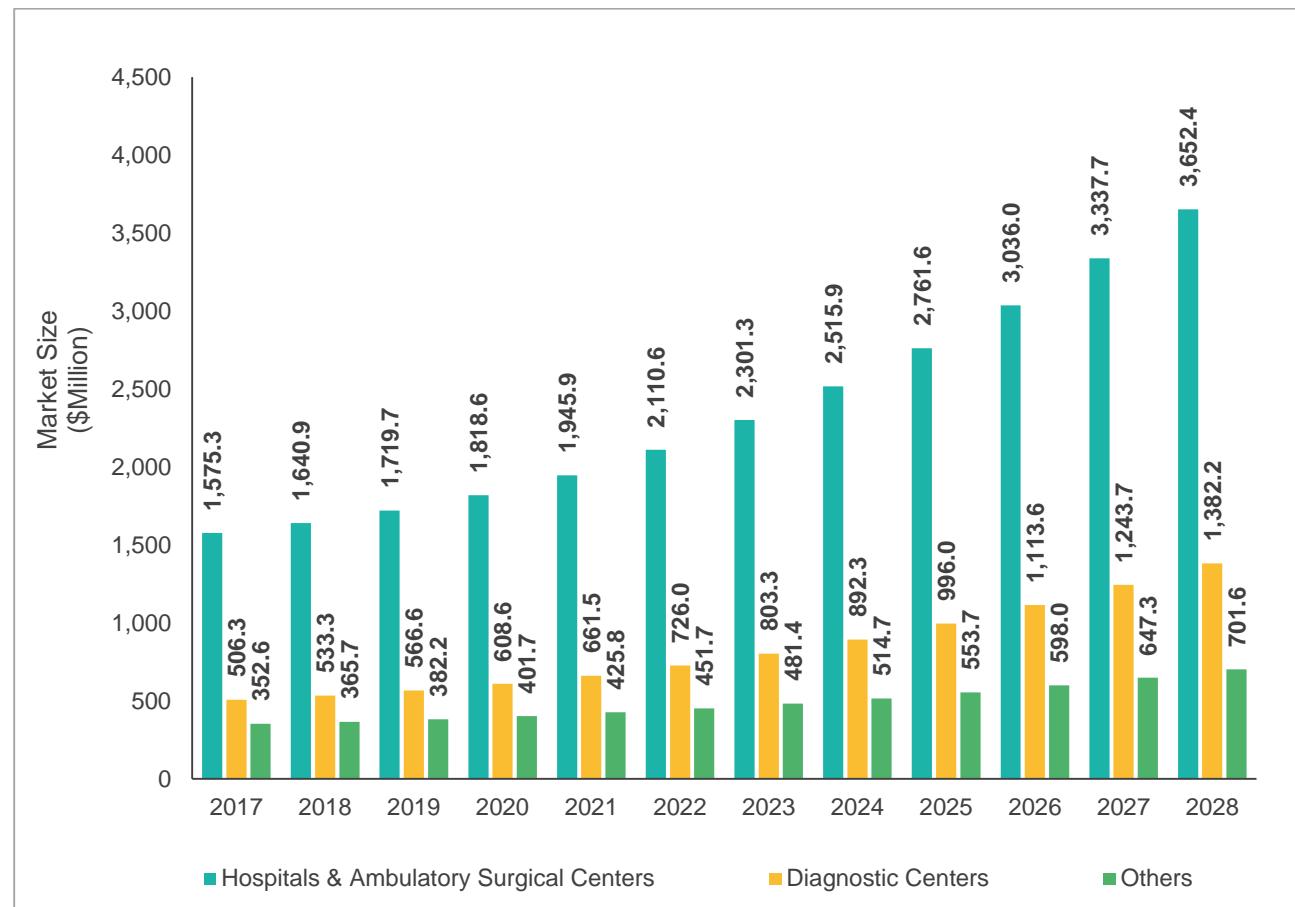
A surge in the occurrence of common disorders identified with chronic pain, particularly in the geriatric population, is the major driver of the portable imaging solutions market. Also, the technological progressions in the diagnostic imaging market, for example, the introduction of diagnostic products compatible with mobile connectivity and transferring of images to PACS workstations, is expected to play a vital role in the market growth during the forecast period. Rapidly venturing healthcare centers, enhancing medicinal services infrastructure, expanding patient awareness and disposable income values are expected to trigger the utilization rates of these modalities and thus increment demand at the end-user levels.

Figure: 6.1 Global Portable Imaging Solutions Market (by End-User)



Source: BIS Research Analysis

The portable imaging solutions market by end-user is segmented into hospitals and ambulatory surgical centers (ASCs), diagnostic centers, and others (private practitioners and contract research organizations, among others). Hospitals mainly concentrate on the clinical applications of chronic disorder management, whereas ambulatory surgery centers are entirely into the business of providing healthcare services at reasonable rates.

Figure: 6.2 Global Portable Imaging Solutions Market (by End-User), 2017-2028


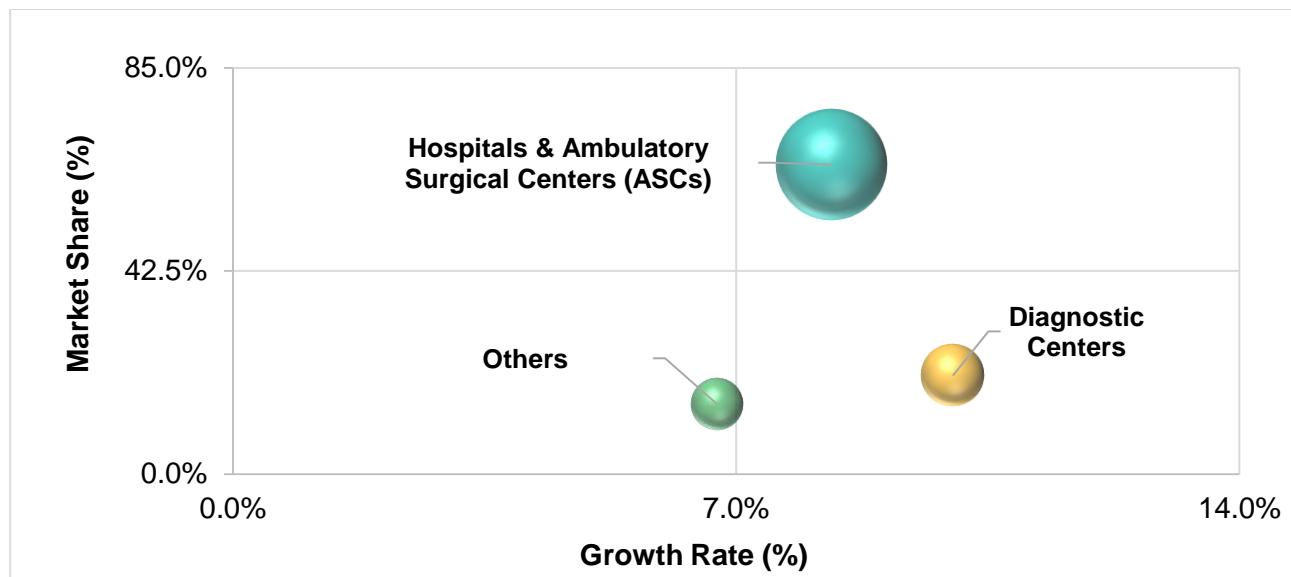
Source: **BIS Research Analysis**

The preceding figure depicts the global portable imaging solutions market (by end-user), for 2017-2028. As of 2017, the global portable imaging solutions market by end-users was dominated by hospitals and ambulatory surgical centers segment. This segment attributed to 64.74% of the total portable imaging solutions market (by end-users) in 2017. In addition, diagnostic centers segment is anticipated to be the fastest growing segment with a CAGR of 9.99% during the forecast period 2018-2028, owing to the increasing number of diagnostic imaging centers on the global level as these centers are the clinical establishments that provide information for the diagnosis, prevention, and treatment of disease by conducting various required investigations, therapies, and procedures.

Furthermore, others segment comprises of private practitioners and contract research organizations, among others. It was valued at \$352.6 million in 2017 and is anticipated to grow to \$701.6 million in 2028 with a CAGR of 6.73% during the forecast period 2018-2028.

6.2 Global Portable Imaging Solutions Market (by End-User) (Market Attractiveness Analysis)

Figure: 6.3 Market Attractiveness Analysis (by End-User) (2018-2028)



Source: BIS Research Analysis

Hospitals and ambulatory surgical centers segment is the dominating end-user segment for portable imaging solutions market. As of 2017, this segment accounted for 64.74% share of the global market size, turning in an estimated revenue of \$1,575.3 million. The preceding figure depicts the hospitals and ambulatory surgical centers segment to have a moderate market share and growth rate. This segment is growing with a healthy CAGR of 8.33% during the forecast period 2018-2028, owing to its increasing use in multiple departments of a single hospital or ambulatory surgical centers.

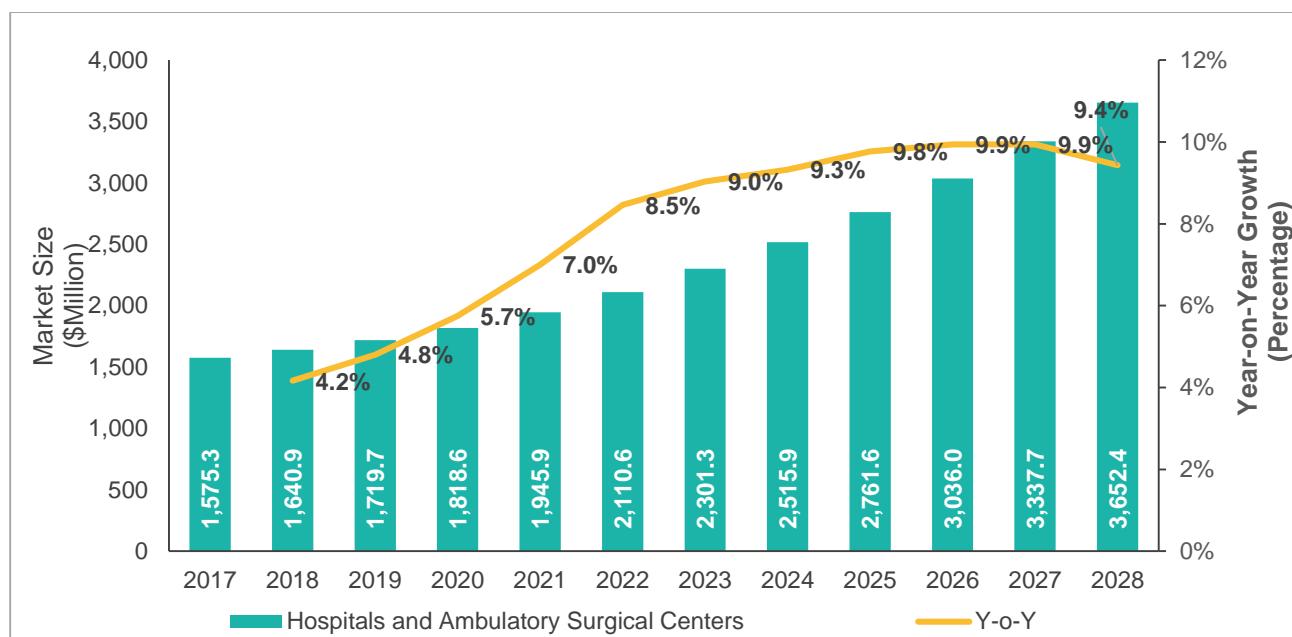
Diagnostic centers are the second-most dominating end-user segment for portable imaging solutions market. As of 2017, this segment accounted for 20.80% share of the global market size, turning in an estimated revenue of \$506.3 million. This segment has become a fast-evolving segment in the global portable imaging solutions market. Increasing number of diagnostic centers on the global level coupled with increased adoption of technologically advanced products are driving the market growth of this segment. The market attractiveness analysis figure depicts the segment to have a moderate market share and the fastest growth rate of 9.99% during the forecast period 2018-2028.

As of 2017, others end-user segment accounted for 14.48% share of the global market size, turning in an estimated revenue of \$352.6 million. The market attractiveness analysis figure above depicts this segment to have a low-moderate market share and growth-rate among all other product type

segments. These estimations indicate that the market in others end-user segment will sustain the growth of CAGR of 6.73% during the forecast period 2018-2028.

6.3 Hospitals and Ambulatory Surgical Centers

Figure: 6.4 Global Portable Imaging Solutions Market (by Hospitals and Ambulatory Surgical Centers), 2017-2028



Source: BIS Research Analysis

The preceding figure depicts the global portable imaging solutions market (by hospitals and ambulatory surgical centers), for 2017-2028. The hospitals and ambulatory surgical centers segment of the global portable imaging solutions market was valued at \$1,575.3 million in 2017 and is anticipated to reach \$3,652.4 million by 2028, growing at a CAGR of 8.33% during the forecast period of 2018-2028.

Hospitals and ambulatory surgical centers are the primary buyers of portable imaging modalities and are significantly increasing in number. Due to the increasing geriatric population, rising prevalence of chronic disorders and continuous technological advancements in diagnostic imaging modalities, there is an increasing demand for imaging technologies from the healthcare providers.

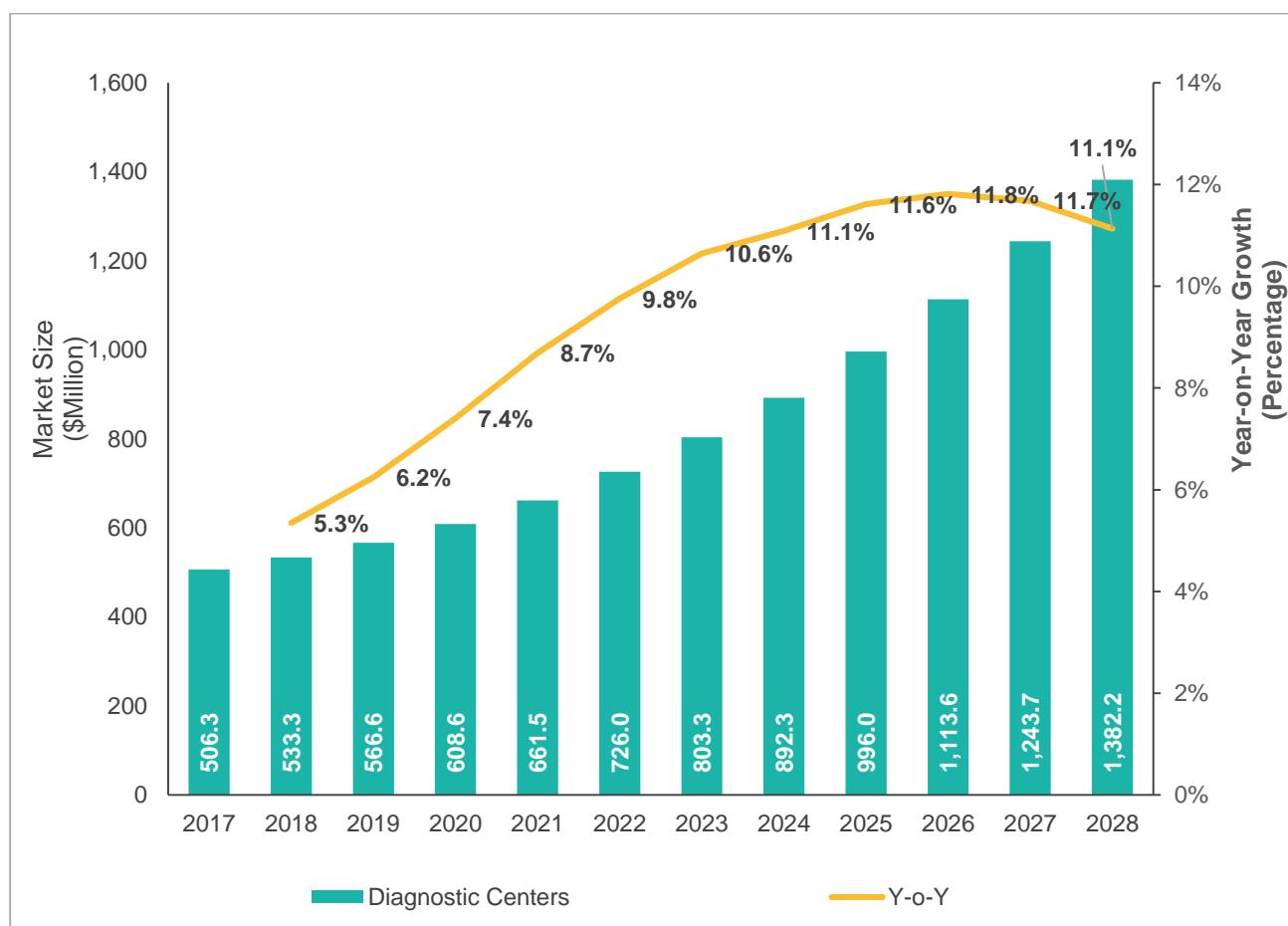
The diagnostic imaging solutions manufacturers develop strategic alliances with hospitals and ambulatory surgical centers. Such alliances serve as a prominent component of the manufacturers'

strategy for sales, marketing, and product development. These partnerships are of different types. For instance,

- First type is comprised of research alliances in which the manufacturers contribute a significant number of equipment, research personnel and some research funding to the customer site. The set of equipment would typically include the latest technologies. These modalities are offered under various terms such as lease recapture arrangements, consignment and steep price discounts.
- Second type of partnerships is comprised of equipment and service alliances. In this, the manufacturers sell the hospital a broad spectrum of equipment across multiple modalities with multi-year agreements for the services and technology upgrades.

6.4 Diagnostic Centers

Figure: 6.5 Global Portable Imaging Solutions Market (by Diagnostic Centers), 2017-2028



Source: BIS Research Analysis

The preceding figure depicts the global portable imaging solutions market (by diagnostic centers), for 2017-2028. The diagnostic centers segment of the global portable imaging solutions market was valued at \$506.3 million in 2017 and is anticipated to reach \$1,382.2 million by 2028, growing at a CAGR of 9.99% during the forecast period of 2018-2028. The number of diagnostic centers has consistently been increasing over the last few years considering the rapidly growing geriatric population and the volume of diagnostic tests being performed. These specialized centers also improve the quality of healthcare delivery by providing a patient the convenience both in terms of procedure cost and waiting time.

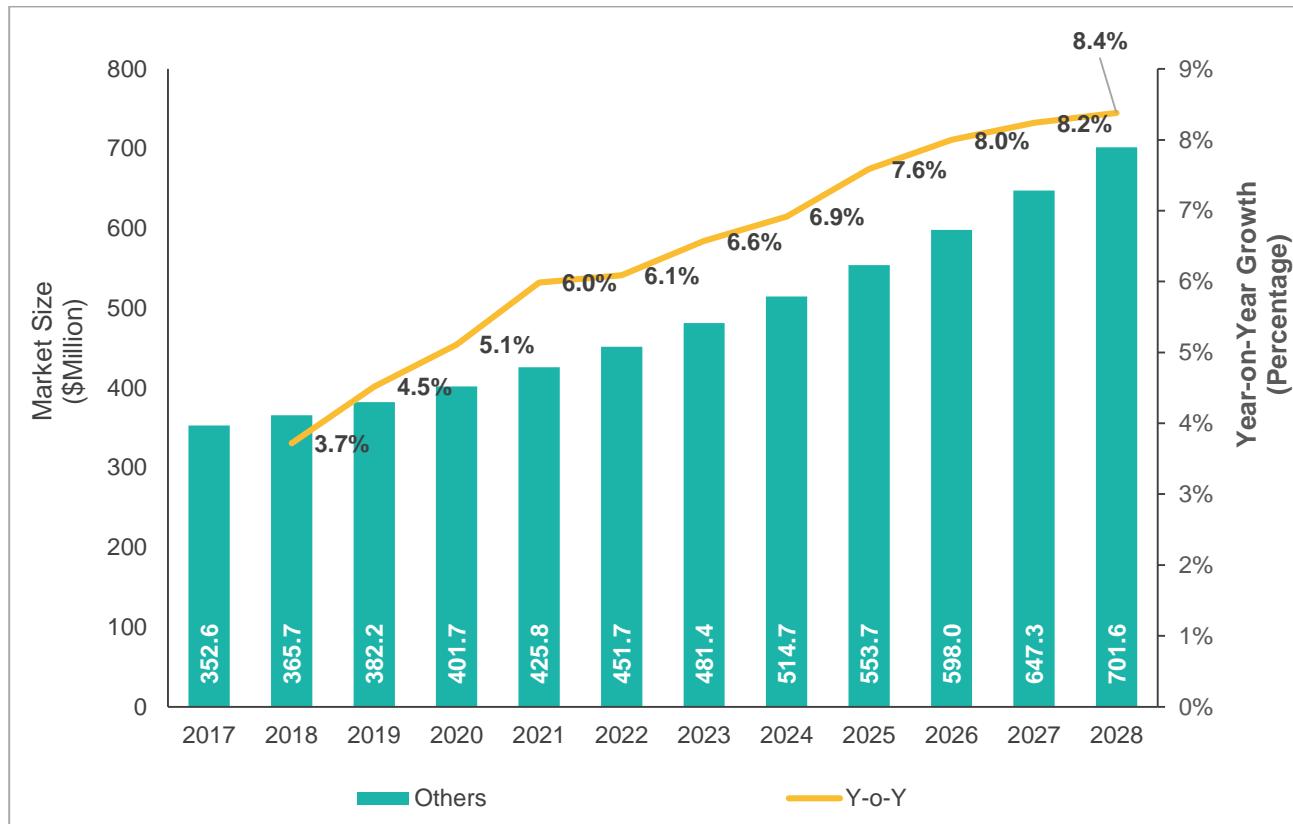
Table: 6.1 Total Number of Outpatient Diagnostic Imaging Centers (U.S.)

Year	Diagnostic Centers	Y-o-Y (%)	CAGR (%) (2000-2013)
2000	4,623		
2001	4,887	5.7	
2002	5,184	6.1	
2003	6,183	19.3	
2004	6,380	3.2	
2005	6,677	4.7	
2006	6,786	1.6	
2007	7,076	4.3	
2008	7,080	0.1	
2009	6,984	-1.4	
2010	6,846	-2	
2011	6,774	-1.1	
2012	6,868	1.4	
2013	6,740	-1.9	

Source: U.S. Census data and BIS Research Analysis

6.5 Other End-Users

Figure: 6.6 Global Portable Imaging Solutions Market (by Other End-Users), 2017-2028



Source: BIS Research Analysis

The preceding figure depicts the global portable imaging solutions market (by other end-users), for 2017-2028. The other end-users segment of the global portable imaging solutions market was valued at \$352.6 million in 2017 and is anticipated to reach \$701.6 million by 2028, growing at a CAGR of 6.73% during the forecast period of 2018-2028.

The other end-users comprise private practitioners and contract research organizations (CROs), among others. There is a rising trend of using portable imaging solutions for point-of-care applications among the private practitioners as these systems add both benefits to the healthcare providers and to the patients by offering them both convenient and private diagnostic treatment procedures.

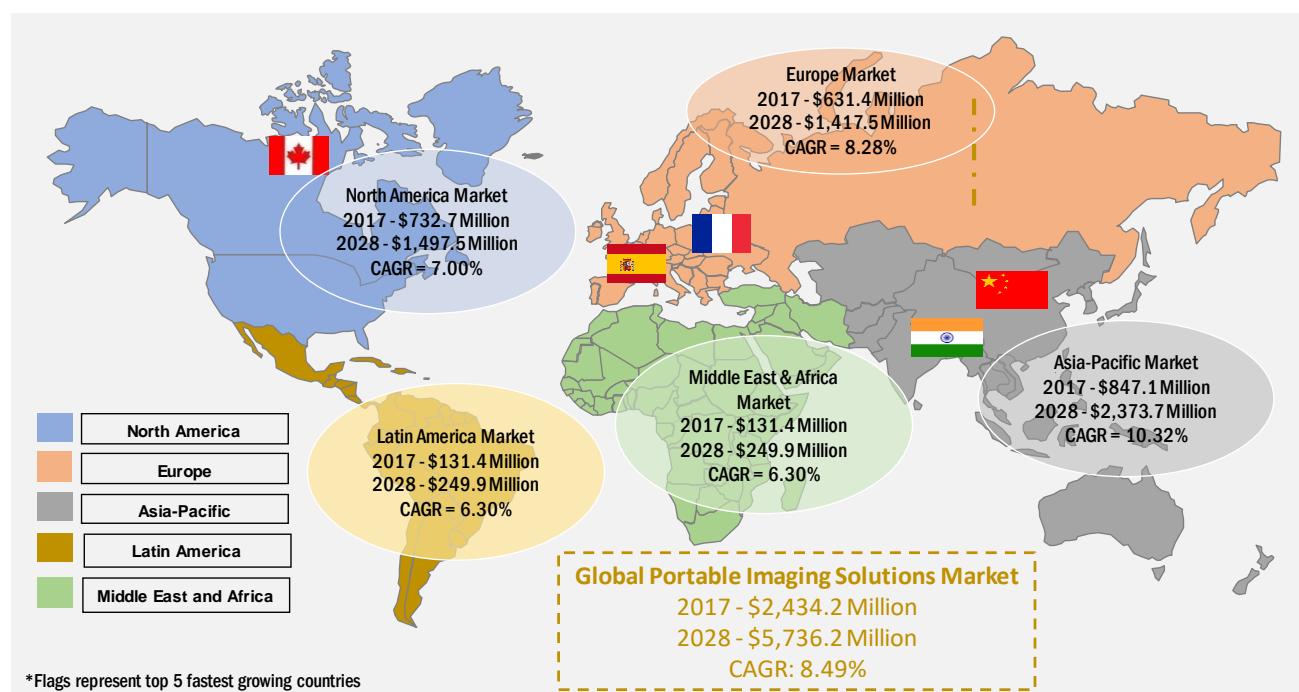
Moreover, these modalities are also becoming a major tool in the pharmaceutical clinical trials as they offer visualization-based diagnostics and facilitation with the quantitative assessment. Diagnostic imaging systems measure imaging biomarkers of drugs and detects minute changes during therapy, which remain undetected in the conventional drug trial-approaches or techniques.

7. Global Portable Imaging Solutions Market (by Region)

7.1 Overview

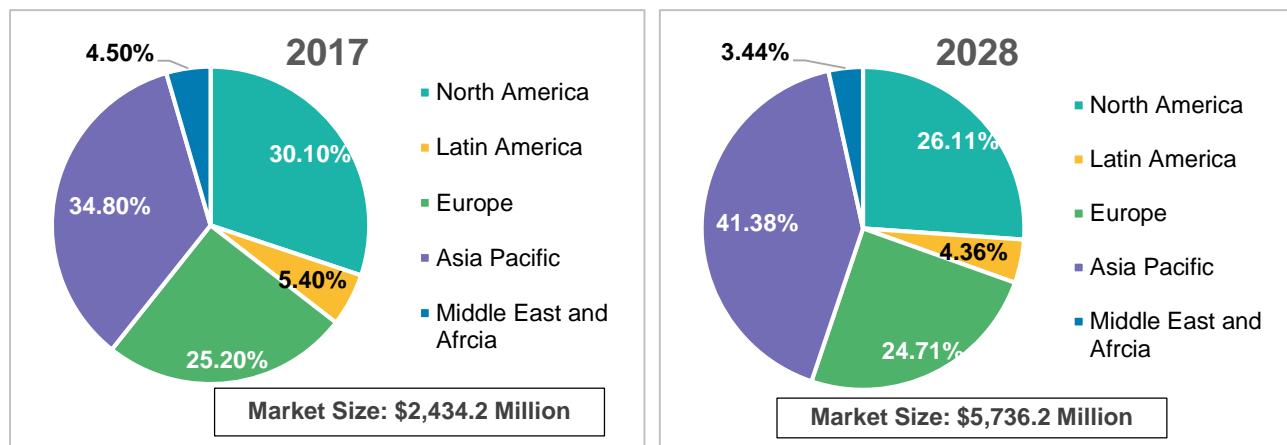
This section describes the potential of the global portable imaging solutions market with respect to different regions namely North America, Europe, Asia-Pacific, Latin America, and Middle East & Africa. The section also comprises country-level analysis of the market, along with the key macroeconomic factors driving the market growth in economies. Further, the chapter analyses the ongoing trends in the industry in major regions by probing into the past and the present government regulations and the macro and micro-economic factors.

Figure: 7.1 Global Portable Imaging Solutions Market Scenario, 2017 and 2028



Source: BIS Research Analysis

The preceding figure depicts the potential of portable imaging solutions market across different regions in terms of value and growth rate.

Figure: 7.2 Global Portable Imaging Solutions Market (by Region), 2017 and 2028


Source: BIS Research Analysis

The preceding figure illustrates the value of portable imaging solutions market across different regions. The global portable imaging solutions market was valued at \$2,434.2 million in 2017 and is anticipated to reach \$5,736.2 million by 2028, registering a CAGR of 8.49% in the forecast period 2018-2028. The Asia-Pacific is currently the leading contributor to the market in terms of market value. In the year 2017, the contribution of the Asia-Pacific region was valued to be 34.80% of global market revenue.

High prevalence and incidence rate of chronic diseases, increasing geriatric population, and huge patient population base, among others, aided by the increasing government initiatives, are the leading factors promoting the growth of portable imaging solutions in Asia-Pacific region.

Further, owing to the regular product launches made by key players such as Siemens Healthineers, Inc., Shimadzu Corporation, and Konica Minolta, Inc., the Asia-Pacific portable imaging solutions market is anticipated to grow at highest CAGR of 10.32% in the forecast period 2018-2028.

Correlating the fact, the contribution of the Asia-Pacific region is anticipated to reach 41.38% of global market revenue by 2028.

Followed by Asia-Pacific, North America region is the second largest market for portable imaging solutions. In the year 2017, the contribution of the region was valued to be 30.10% of global market value. However, the strict regulations imposed by the U.S. Food and Drug Administration (U.S. FDA) is hampering the growth of North America portable imaging solutions market.



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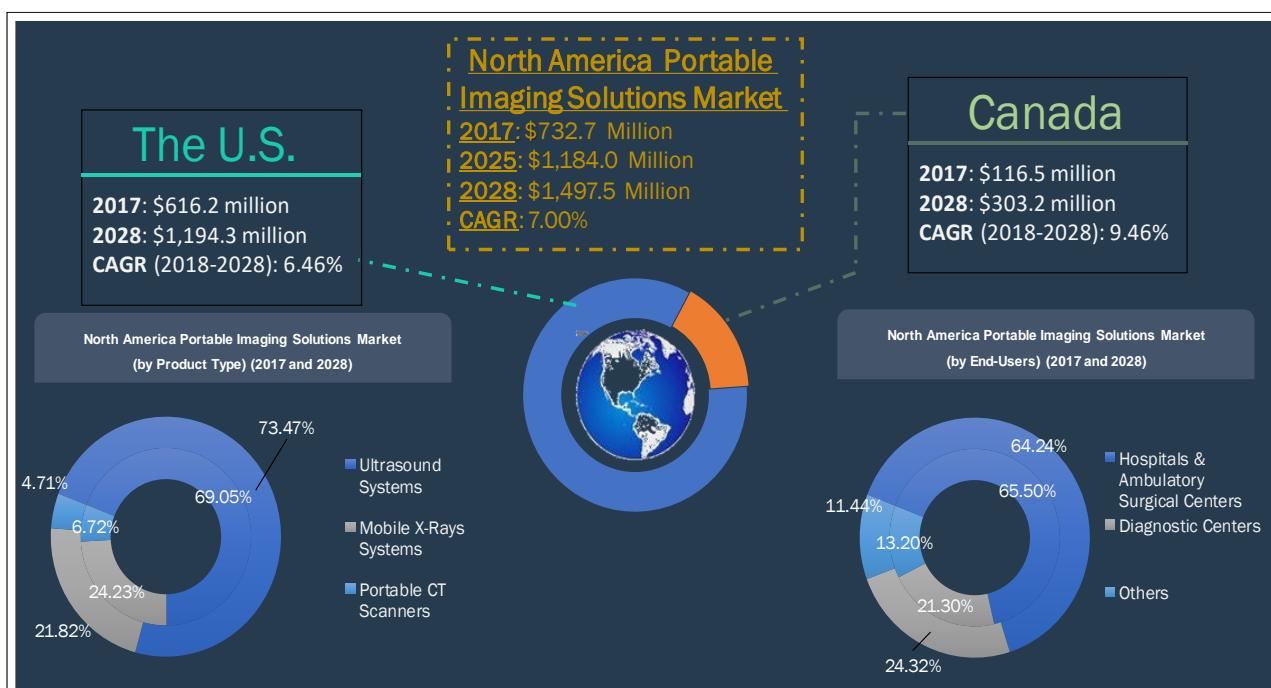
Global Portable Imaging Solutions Market

7.2 North America Portable Imaging Solutions Market

7.2.1 Market Snapshot

North America medical device market is the early adopter of the latest technologies and has now turned into a technological hub for the companies offering advanced solutions to the healthcare market. With the presence of all the major companies in the market, this region acquires the major share in the market. The region also offers potential growth opportunities to the companies owing to the increased adoption of these technologies across various verticals of the healthcare industry.

Figure: 7.3 Market Snapshot: North America Portable Imaging Solutions Market



Source: BIS Research Analysis

Note: Inner circle represents 2017 market size and outer circle represents 2028 market size

Table: 7.1 Macro-Economic Factors Driving the Market Growth of Portable Imaging Solutions in North America (2016-2022)

Factors	2016	2017	2018	2019	2020	2021	2022
Population (\$Million)	359.36	362.00	364.61	367.21	369.79	372.37	374.93
GDP (\$Billion)	20,160.27	20,896.30	21,642.82	22,387.14	23,127.86	23,863.38	24,592.30
Health Insurance Coverage (%)	95.60	96.30	96.75	96.75	96.70	97.00	97.15

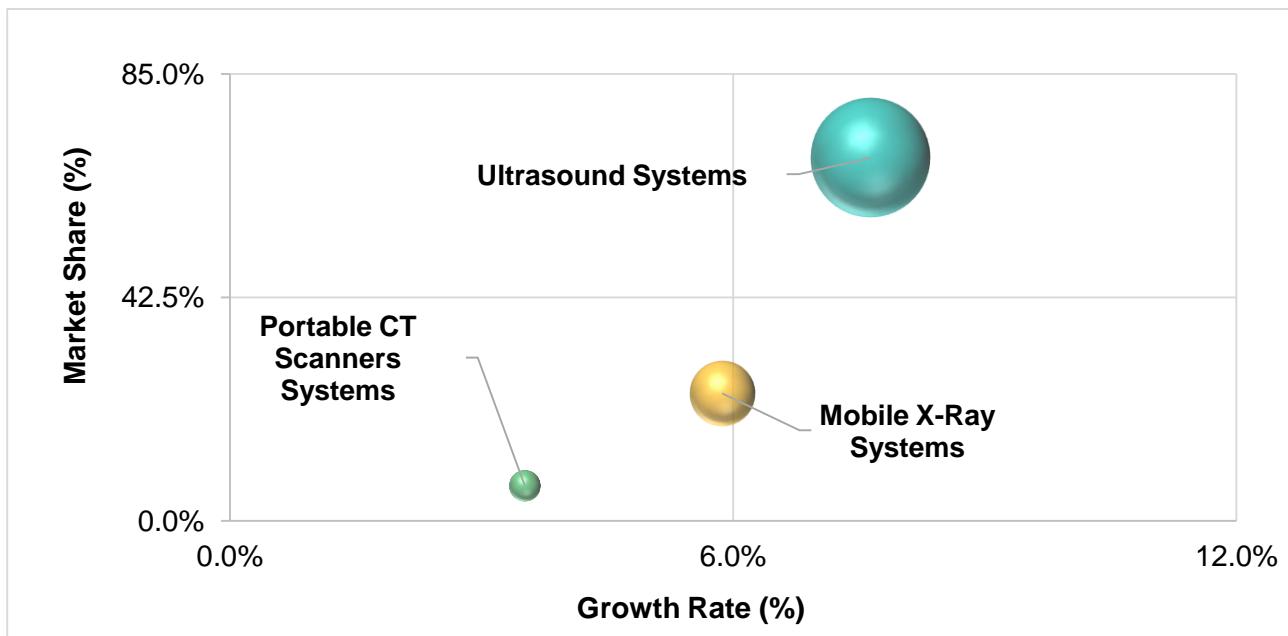


Number of Doctors/10,000 Population	25.68	25.69	25.74	25.75	25.85	25.93	25.97
Total Healthcare Market (\$Billion)	3,339.55	3,444.69	3,554.10	3,666.62	3,782.23	3,901.24	4,023.54
Total Medical Devices Market (\$Billion)	154.40	163.01	172.33	182.37	193.22	204.99	217.68

Source: BIS Research Analysis

7.2.2 North America Portable Imaging Solutions Market (by Product Type) (Market Attractiveness Analysis)

Figure: 7.4 North America: Market Attractiveness Analysis (by Product Type) (2018-2028)



Source: BIS Research Analysis.

Ultrasound systems segment is the dominating product type segment for North America portable imaging solutions market. As of 2017, this segment accounted for 69.05% share of the North America market size, turning in an estimated revenue of \$505.9 million. The market attractive analysis figure given above depicts this ultrasound systems segment to have a high market share and a high growth rate. These estimations indicate that the market for ultrasound systems is already replete with a huge number of products addressing the respective needs. This segment is growing with a healthy CAGR of 7.64% during the forecast period 2018-2028.

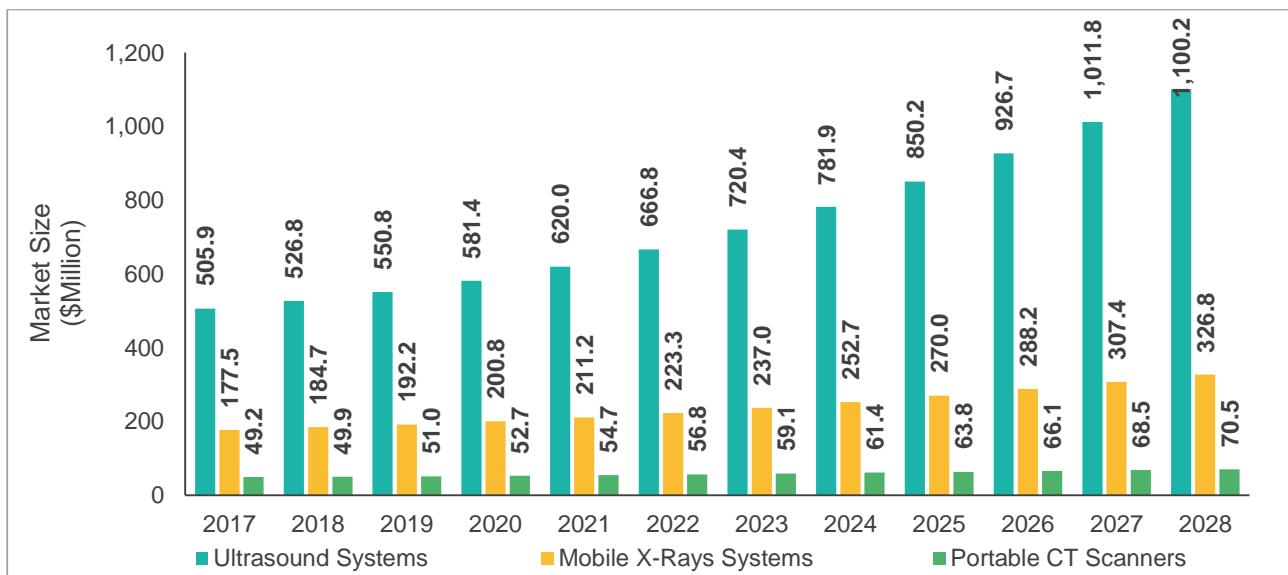
Mobile X-ray systems are the second-most dominating product type segment for North America portable imaging solutions market. As of 2017, this segment accounted for 24.23% share of the North America market size, turning in an estimated revenue of \$177.5 million. This segment has become a fast-evolving segment in North America portable imaging solutions market. Various government initiatives in the U.S. regarding the use of these modalities are impelling the market growth of mobile X-ray systems. The market attractiveness analysis figure depicts this segment to have a moderate market share and growth-rate among all other product type segments. These estimations indicate that the market for mobile X-ray systems is rapidly evolving and will sustain the growth with a robust CAGR of 5.87% during the forecast period 2018-2028.

As of 2017, portable CT scanners product type segment accounted for 6.72% share of the North America market size, turning in an estimated revenue of \$49.2 million. The market attractiveness analysis figure given above depicts this segment to have a low-moderate market share and growth-rate among all other product type segments. These estimations indicate that the market for portable CT scanners will sustain the growth of a CAGR of 3.51% during the forecast period 2018-2028.

7.2.3 North America Portable Imaging Solutions Market (by Product Type)

North America portable imaging solutions market is foreseen to be majorly driven by growing prevalence and incidence rate of chronic disorders as well as the rising government initiatives in the U.S. The North America portable imaging solutions market was valued at \$732.7 million in 2017 and is anticipated to reach \$1,497.5 million by 2028, growing at a CAGR of 7.00% during the forecast period of 2018-2028.

Figure: 7.5 North America Portable Imaging Solutions Market (by Product Type), 2017-2028



Source: BIS Research Analysis

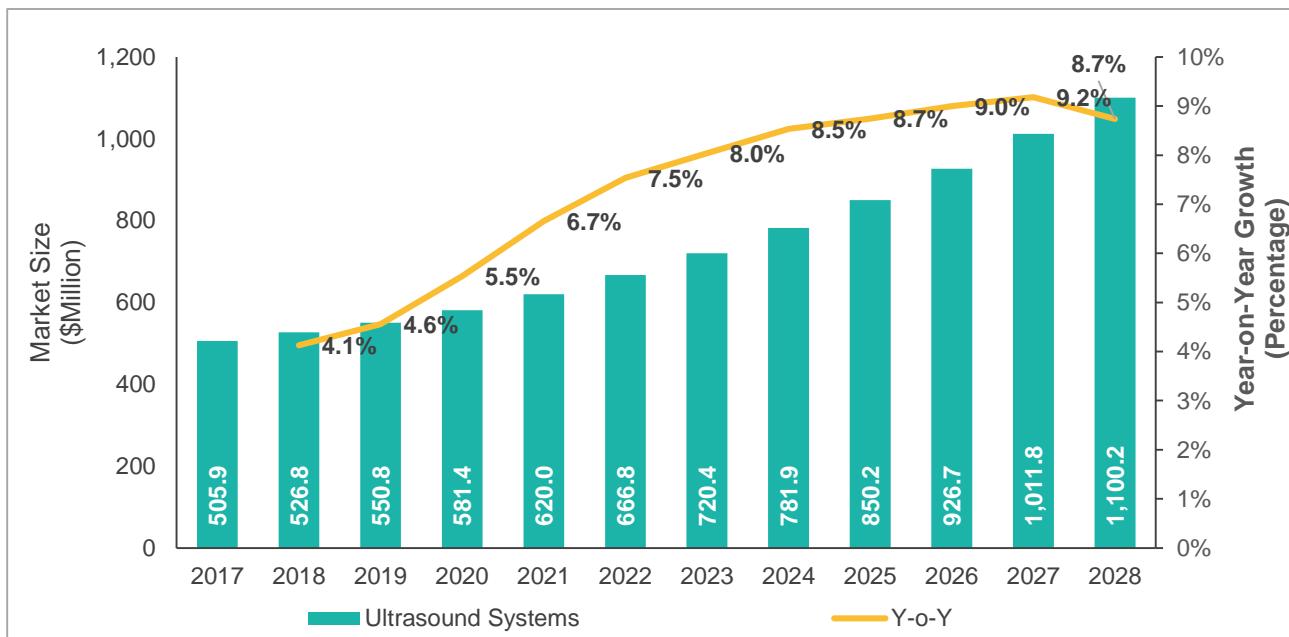


The preceding figure depicts the North America portable imaging solutions market (by product type), for 2017-2028. As of 2017, the North America portable imaging solutions market by product type was dominated by ultrasound systems. This segment attributed to 69.05% of the total North America portable imaging solutions market (by product type) in 2017. In addition, ultrasound segment is anticipated to be the fastest growing segment with a CAGR of 7.64% from 2018-2028, owing to an increasing adoption among the radiologists for its multi-applications feature.

In addition to that, mobile X-ray systems segment was valued at \$177.5 million in 2017 and is estimated to grow to \$326.8 million in 2028 with a CAGR of 5.87% from 2018-2028, owing to the emergence of technologically advanced digital mobile X-ray systems. Whereas, portable CT scanners segment was valued at \$49.2 million in 2017 and is anticipated to reach \$70.5 million in 2028 with a CAGR of 3.51% from 2018-2028.

7.2.3.1 North America Ultrasound Systems Market

Figure: 7.6 North America Portable Imaging Solutions Market (by Ultrasound Systems), 2017-2028

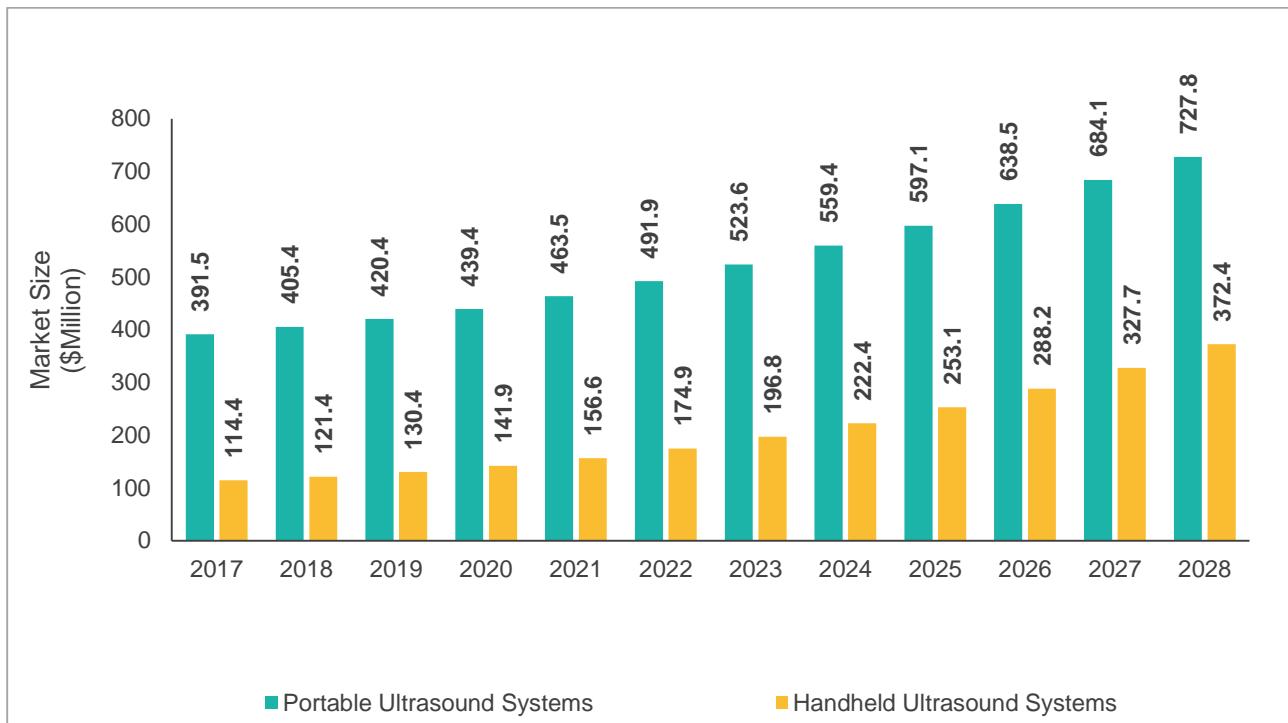


Source: BIS Research Analysis

The preceding figure depicts the North America portable imaging solutions market (by ultrasound systems), for 2017-2028. The ultrasound segment of the North America portable imaging solutions market was valued at \$505.9 million in 2017 and is anticipated to reach \$1,100.2 million by 2028, growing at a CAGR of 7.64% during the forecast period 2018-2028. The ultrasound systems are the

fastest growing segment in North America portable imaging solutions market, owing to its capability of real-time monitoring which lead the market with high growth attributed to their advanced features and effective functionalities.

Figure: 7.7 North America Portable Imaging Solutions Market (by Portable Ultrasound Systems and Handheld Ultrasound Systems), 2017-2028

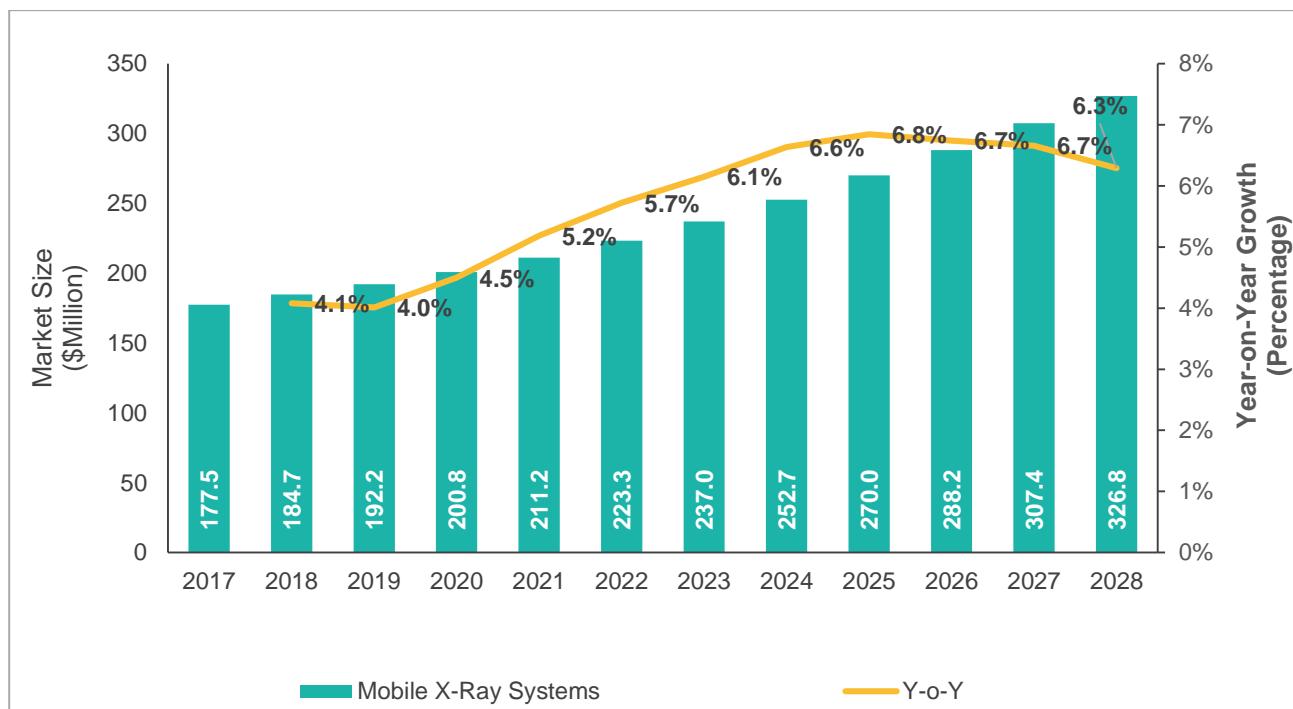


Source: *BIS Research Analysis*

The preceding figure depicts the North America portable imaging solutions market (by portable ultrasound systems and handheld ultrasound systems), for 2017-2028. The portable ultrasound systems market was estimated to have a value of \$391.5 million, in 2017. The market is expected to grow at a CAGR of 6.02% during the forecast period 2018-2028 and attain a value of \$727.8 million by 2028. Whereas, handheld ultrasound systems market is anticipated to grow at the fastest rate within the North America ultrasound systems market attaining a CAGR of 11.86% during the forecast period 2018-2028.

7.2.3.2 North America Mobile X-Ray Systems Market

Figure: 7.8 North America Portable Imaging Solutions Market (by Mobile X-Ray Systems), 2017-2028

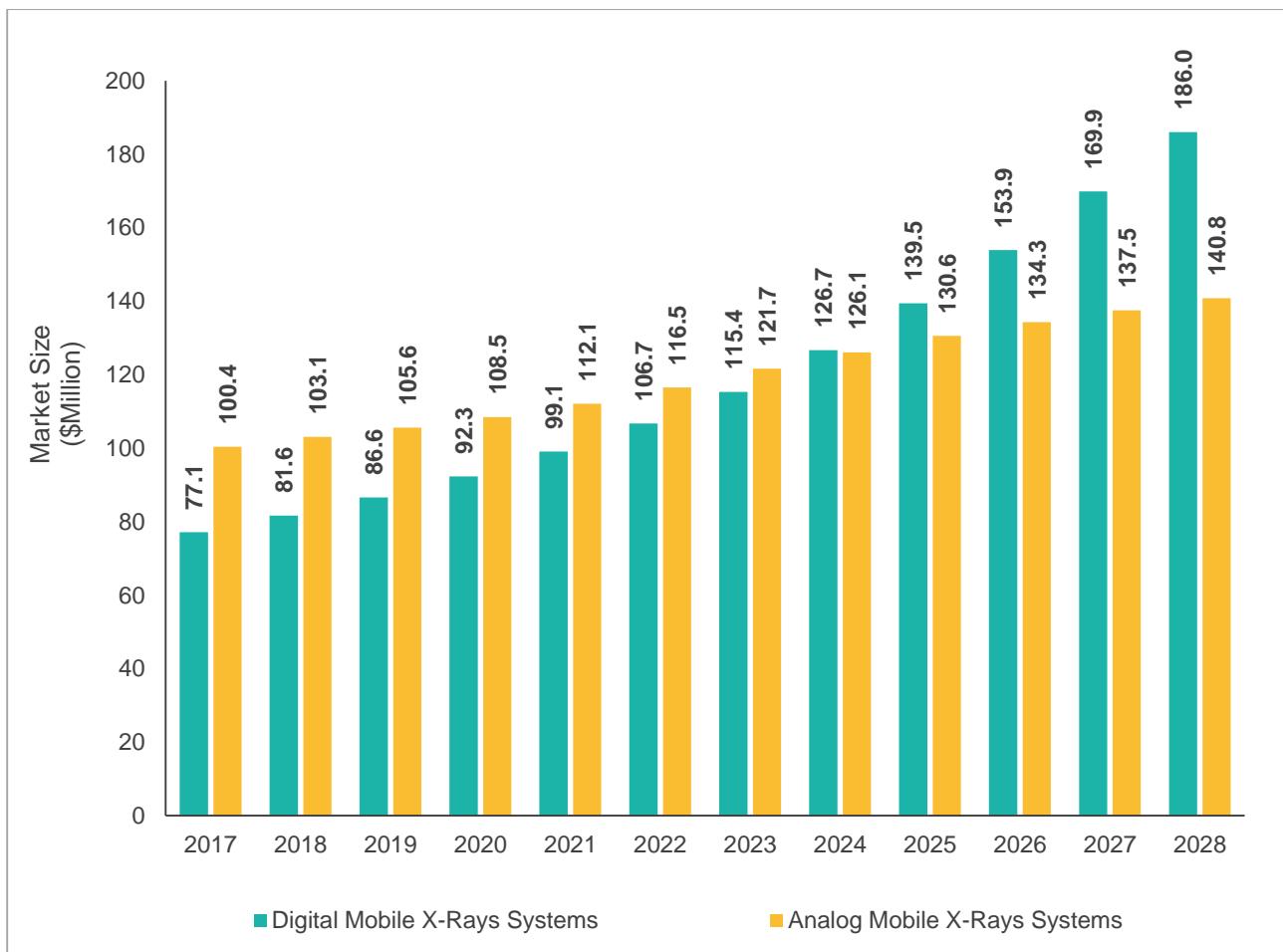


Source: BIS Research Analysis

The preceding figure depicts the North America portable imaging solutions market (by mobile X-ray systems), for 2017-2028. The mobile X-ray systems segment of the North America portable imaging solutions market was valued at \$177.5 million in 2017 and is anticipated to reach \$326.8 million by 2028, growing at a CAGR of 5.87% during the forecast period of 2018-2028.

The growth is attributed to the implementation of certain rules and regulations by U.S. government regarding the use of mobile X-ray systems. Under the new regulations, healthcare providers who are using analog mobile X-ray systems have to be penalized by CMS. This factor will drive the market growth of digital mobile X-ray systems in North America. The U.S. government is focused on shifting from conventional to a digital healthcare model, so as to align these technologies with Electronic Health Records (EHR).

Figure: 7.9 North America Portable Imaging Solutions Market (by Analog Mobile X-Ray Systems and Digital Mobile X-Ray Systems), 2017-2028

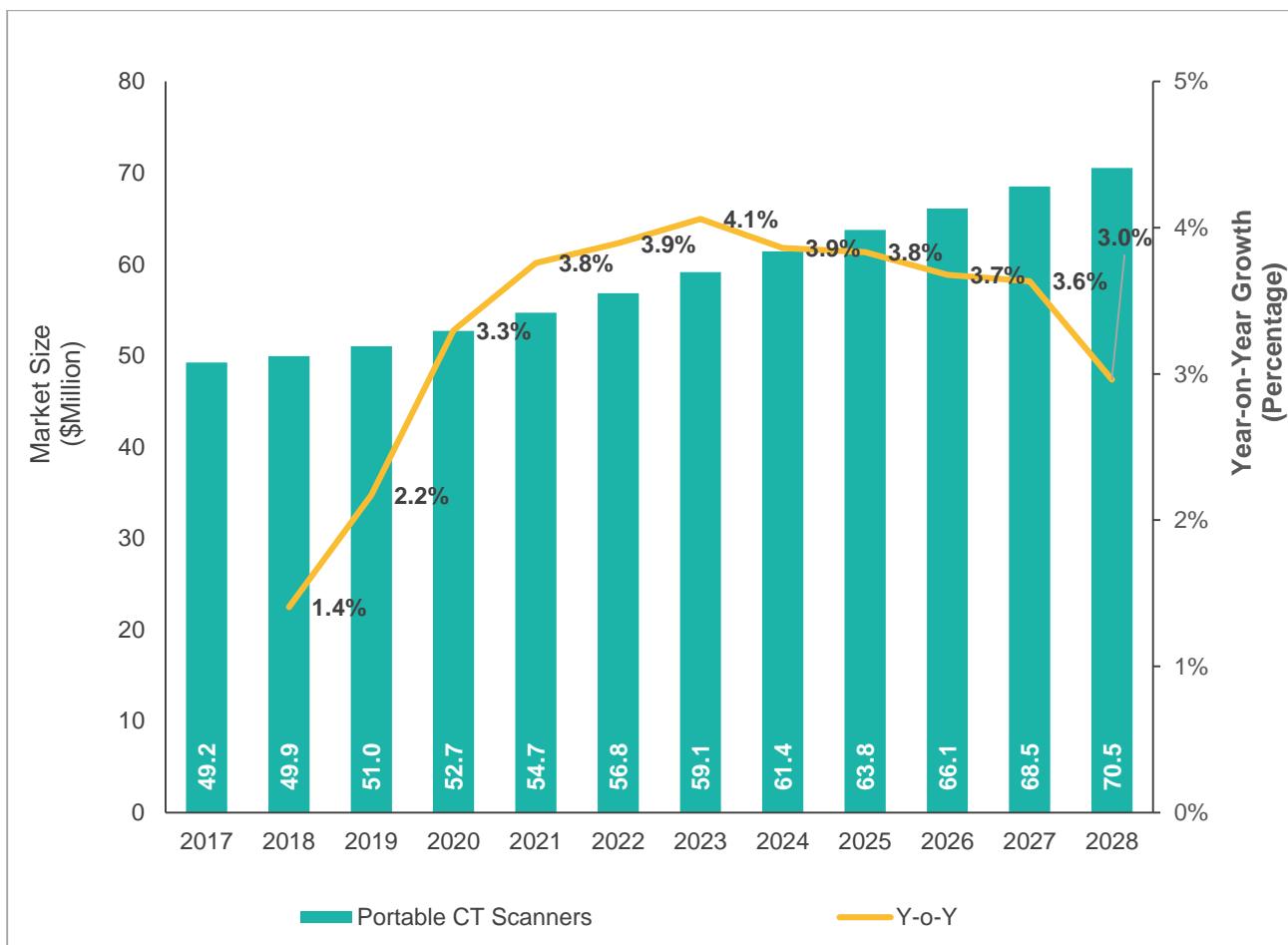


Source: *BIS Research Analysis*

The preceding figure depicts the North America portable imaging solutions market (by analog mobile X-ray systems and digital mobile X-ray systems), for 2017-2028. The analog mobile X-ray systems market was estimated to have a value of \$100.4 million, in 2017. The market is expected to grow at a CAGR of 3.16% during the forecast period 2018-2028 and attain a value of \$140.8 million by 2028. Whereas, the digital mobile X-ray systems market is anticipated to grow at the fastest rate within the North America mobile X-ray systems market attaining a CAGR of 8.59% during the forecast period 2018-2028.

7.2.3.3 North America Portable CT Scanners Market

Figure: 7.10 North America Portable Imaging Solutions Market (by Portable CT Scanners), 2017-2028



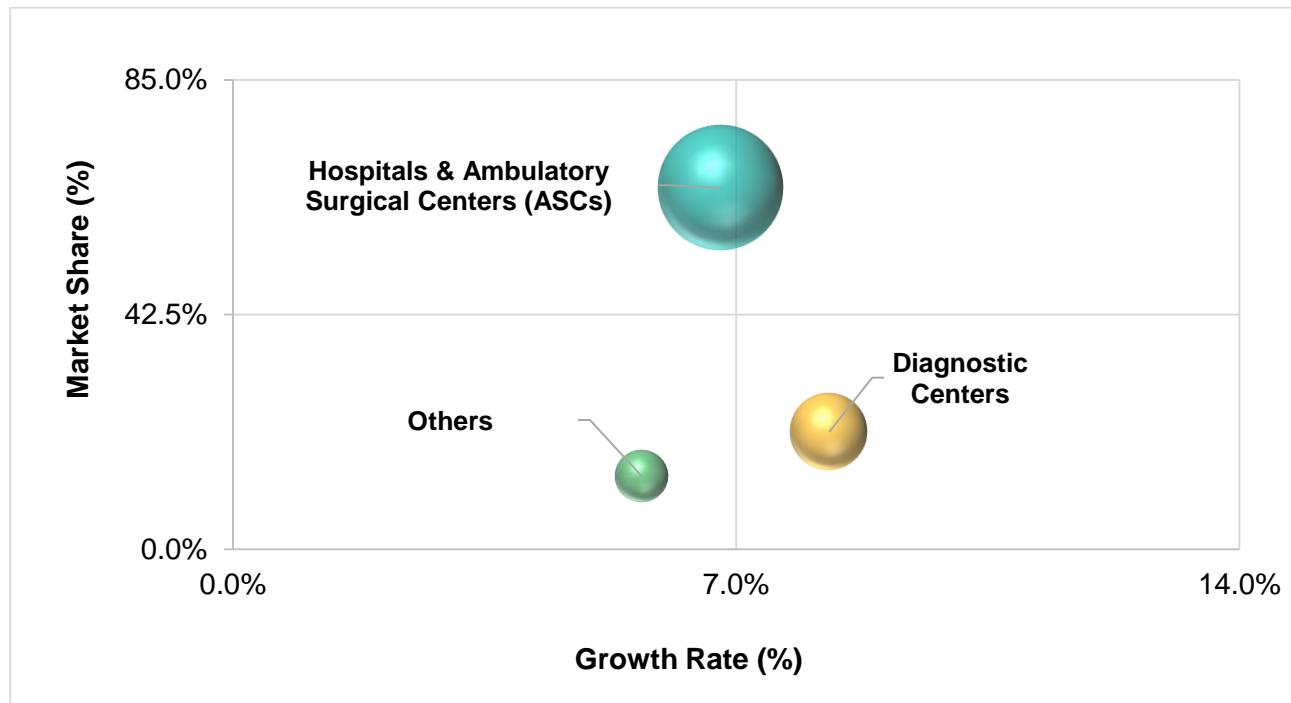
Source: BIS Research Analysis.

The preceding figure depicts the North America portable imaging solutions market (by portable CT scanners), for 2017-2028. The portable CT scanners segment of the North America portable imaging solutions market was valued at \$49.2 million in 2017 and is anticipated to reach \$70.5 million by 2028, growing at a CAGR of 3.51% during the forecast period of 2018-2028.

North America holds the largest share in global portable CT scanners market, with 36.0% share held in 2017. This growth is attributed to its usefulness and feasibility in surgical decision making and its ability to integrate into the operating rooms. This will lower the changes of risk in shifting critically ill patients from one department to other for neurological imaging procedures.

7.2.4 North America Portable Imaging Solutions Market (by End-User) (Market Attractiveness Analysis)

Figure: 7.11 North America: Market Attractiveness Analysis (by End-User) (2018-2028)



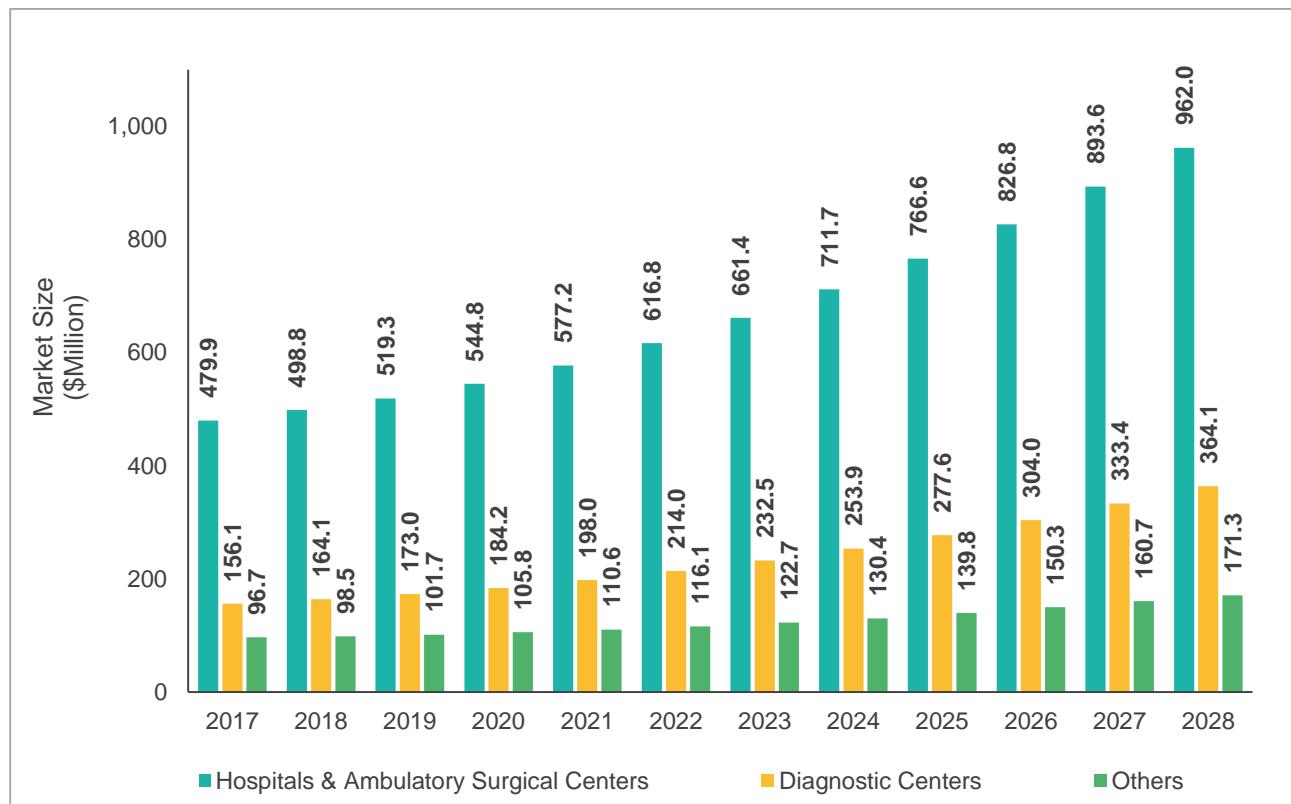
Source: BIS Research Analysis.

Hospitals and ambulatory surgical centers segment is the dominating end-user segment for North America portable imaging solutions market. As of 2017, this segment accounted for 65.50% share of the North America market size, turning in an estimated revenue of \$479.9 million. The market attractive analysis figure given above depicts the hospitals and ambulatory surgical centers segment to have a moderate market share and growth rate. This segment is growing with a healthy CAGR of 6.79% during the forecast period 2018-2028.

Diagnostic centers are the second-most dominating end-user segment for portable imaging solutions market. As of 2017, this segment accounted for 21.30% share of the North America market size, turning in an estimated revenue of \$156.1 million. This segment has become a fast-evolving segment in North America portable imaging solutions market. Increasing number of diagnostic centers in North America is driving market growth for this segment. As of 2017, others end-user segment accounted for 13.20% share of the North America market size, turning in an estimated revenue of \$96.7 million. The market attractiveness analysis figure above depicts this segment to have a low-moderate market share and growth rate. These estimations indicate that the market in others end-user segment will sustain the growth of a CAGR of 5.69% during the forecast period 2018-2028.

7.2.5 North America Portable Imaging Solutions Market (by End-Users)

Figure: 7.12 North America Portable Imaging Solutions Market (by End-Users), 2017-2028



Source: BIS Research Analysis.

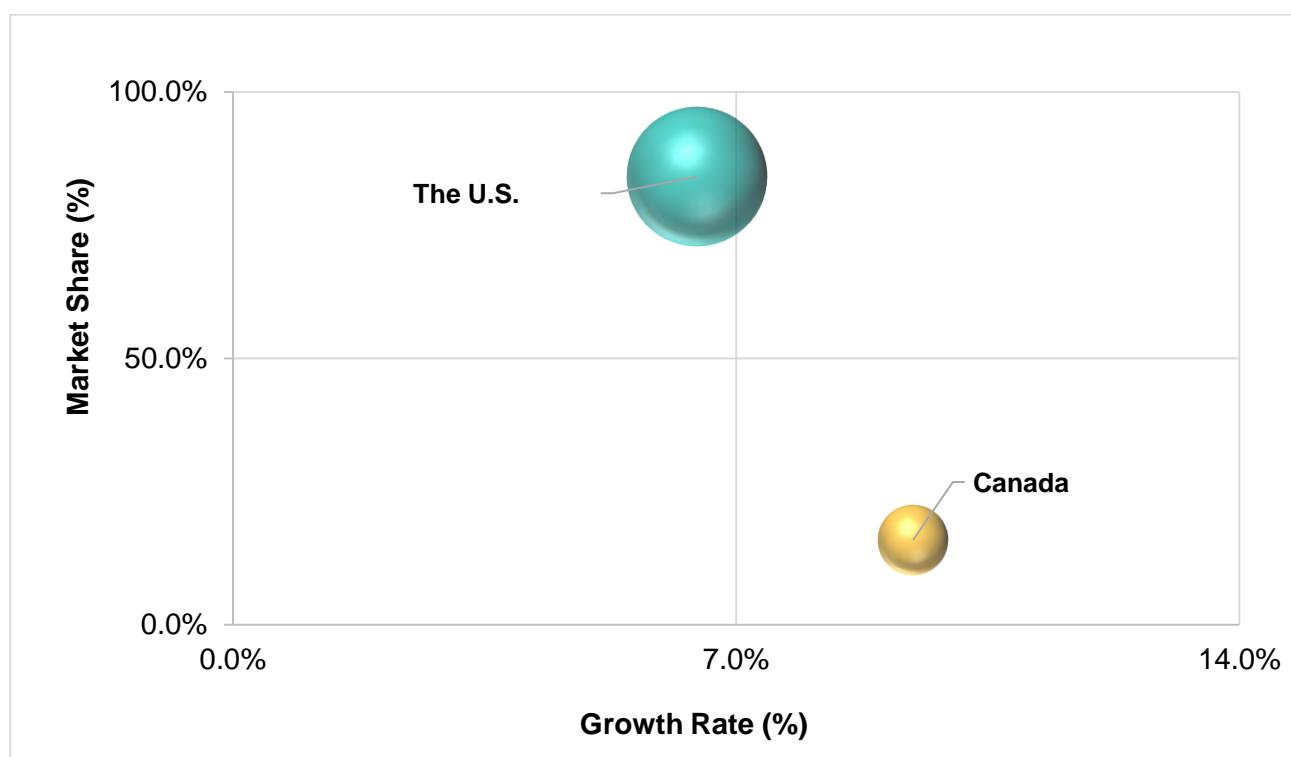
The preceding figure depicts the North America portable imaging solutions market (by end-user), for 2017-2028. As of 2017, the North America portable imaging solutions market by end-users was dominated by hospitals and ambulatory surgical centers. This segment attributed to 65.50% of the total North America portable imaging solutions market (by end-user) in 2017. Also, hospitals and ambulatory surgical centers segment is anticipated to be the moderate growing segment with CAGR of 6.79% from 2018-2028.

In addition to that, diagnostic centers segment was valued at \$156.1 million in 2017 and is estimated to grow to \$364.1 million in 2028 with a CAGR of 8.29% from 2018-2028, whereas, others end-user segment was valued at \$96.7 million in 2017 and is anticipated to reach \$171.3 million in 2028 with a CAGR of 5.69% from 2018-2028.

Rising incidences of various types of chronic disorders, growing geriatric population, technological advancements in diagnostic imaging modalities and increasing support by the government, are some of the prime factors that are propelling the growth of North America portable imaging solutions market.

7.2.6 North America Portable Imaging Solutions Market (by Country) (Market Attractiveness Analysis)

Figure: 7.13 North America: Market Attractiveness Analysis (by Country) (2018-2028)



Source: BIS Research Analysis

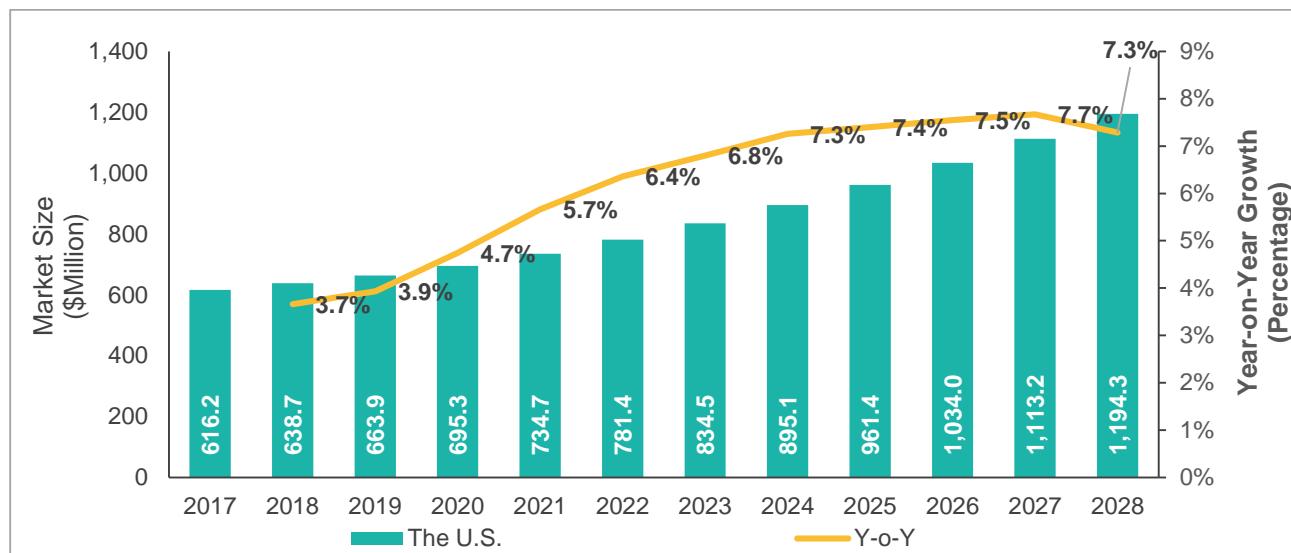
The U.S. is the dominating economy in North America portable imaging solutions market. As of 2017, the U.S. accounted for 84.10% share of the North America market size, turning in an estimated revenue of \$1,194.3 million. The above market attractive analysis figure depicts the U.S. to have a large market share and moderate growth rate. The market in this country is growing with a CAGR of 6.49% during the forecast period 2018-2028.

Canada is the second-most dominating country in the portable imaging solutions market. As of 2017, Canada accounted for 15.90% share of the North America market size, turning in an estimated revenue of \$303.2 million. The market attractiveness analysis figure given above depicts the country

to have a moderate market share, and fastest growth rate of 9.46% during the forecast period 2018-2028, owing to the various market supporting initiatives implemented by the Canadian government.

7.2.6.1 The U.S.

Figure: 7.14 The U.S. Portable Imaging Solutions Market, 2017-2028



Source: BIS Research Analysis

The preceding figure depicts the U.S. portable imaging solutions market, for 2017-2028. The U.S. portable imaging solutions market was valued at \$616.2 million in 2017 and is expected to reach \$1,944.3 million by 2028, growing at a CAGR of 6.46% during the forecast period 2018-2028.

Factors such as the swift pace of technological advancements, a hybrid fusion of different imaging systems, and increasing demand for platform independent and n-dimensional image visualization, are some of the key growth drivers of this market. Furthermore, rising incidences of various types of cancer is also spurring the growth of the U.S. portable imaging solutions market.

- According to the estimates of American Cancer Society (U.S.), about 1,688,780 new cancer cases were diagnosed in 2017, and about 600,920 Americans were expected to die of cancer in 2017, amounting to an approximate of 1,650 deaths per day. Cancer is the second most common cause of death in the U.S. and accounts for nearly 1 of every four deaths.

The U.S. holds the most significant market for the entire portable imaging solutions market in North America as well as throughout the world, owing to the presence of leading diagnostic imaging

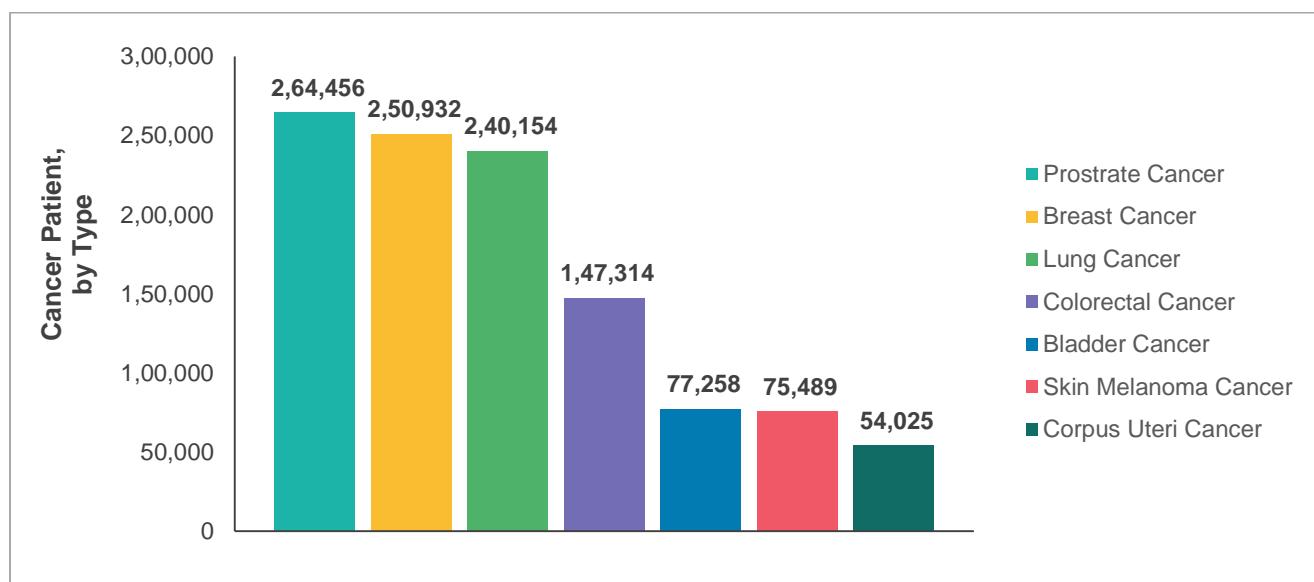
manufacturers such as Siemens Healthineers, Inc., General Electric Company, Koninklijke Philips N.V., Canon Inc., Hitachi, Ltd., and Konica Minolta, Inc., among others.

Table: 7.2 Macro-Economic Factors Driving the Market Growth of Portable Imaging Solutions in the U.S. (2016-2022)

Factors	2016	2017	2018	2019	2020	2021	2022
Population (\$Million)	323.10	325.37	327.60	329.82	332.03	334.23	336.42
GDP (\$Billion)	18,624.50	19,243.90	19,862.50	20,478.90	21,091.70	21,699.30	22,300.30
Health Insurance Coverage (%)	91.20	92.60	93.50	93.50	93.40	94.00	94.30
Number of Doctors/10,000 Population	25.70	25.70	25.75	25.75	25.85	25.92	25.95
Total Healthcare Market (\$Billion)	3,178.70	3,271.00	3,366.30	3,464.60	3,565.90	3,670.50	3,778.30
Total Medical Devices Market (\$Billion)	147.70	156.00	165.00	174.70	185.20	196.60	208.90

Source: BIS Research Analysis

Figure: 7.15 Patient Data by Cancer Type in the U.S. (2016)

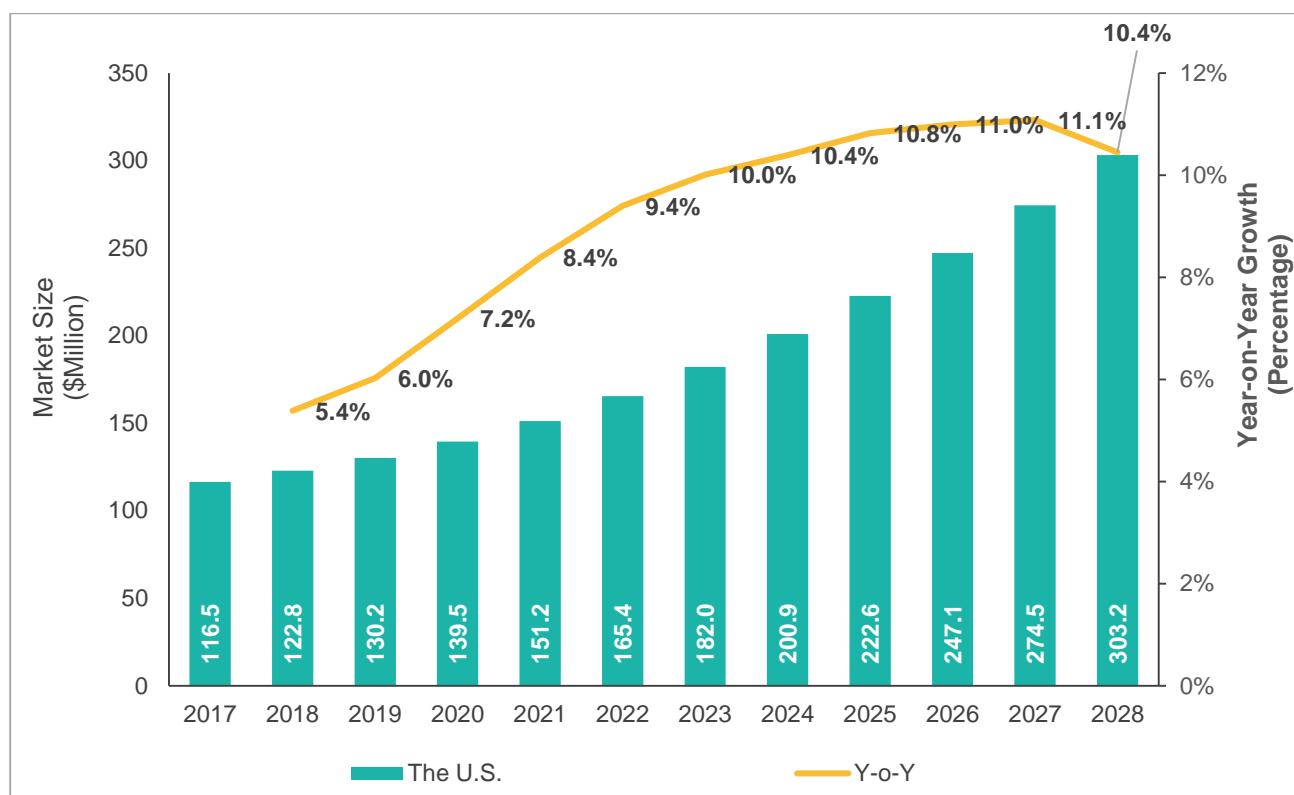


Source: BIS Research Analysis

The preceding figure depicts the total number of patients, by different types of cancer in the U.S. The rise in prevalence and incidence rate of cancer is one of the major factors influencing the portable imaging solutions market in the U.S. According to various studies, breast cancer is the most common cancer type diagnosed in the U.S., followed by prostate, lung, and colorectal cancer, among others.

7.2.6.2 Canada

Figure: 7.16 The Canada Portable Imaging Solutions Market, 2017-2028



Source: BIS Research Analysis

The preceding figure depicts the Canada portable imaging solutions market, for 2017-2028. The Canada portable imaging solutions market was valued at \$116.5 million in 2017 and is expected to reach at \$303.2 million by 2028, growing at a CAGR of 9.46% during the forecast period 2018-2028.

This growth is attributed to the various initiatives implemented by the Canadian government. For instance, in 2004, the Federal Government of Canada launched a program called "Wait Time Reduction", which aimed at reducing waiting time for accessibility of healthcare services by healthcare providers. This resulted in an escalated demand for improved imaging modalities and equipment.

The Canadian government plays a vital role in the growth of Canada's medical imaging cluster. There are several organizations that support the academic research and industry-academic collaboration, such as, Ontario Institute of Cancer Research, and Ontario Center of Excellence (OCE), Center for Probe Development & Commercialization (CPDC) as well as Ontario Ministry of Research and Innovation, funds medical imaging researchers and associated start-ups.

Moreover, several hospitals and universities in Canada are turning out to be the major centers in the fields of biophysics, engineering, and medicine. This makes Canada a significant hub of researchers in medical imaging technologies. Further, with active participation of the well-established research institutes and more collaborations and partnerships with the providers of imaging modalities, the Canadian medical imaging community is turning out to be a dynamic center for imaging innovation in North America.

7.2.6.2.1 Various Challenges in the Canadian Market

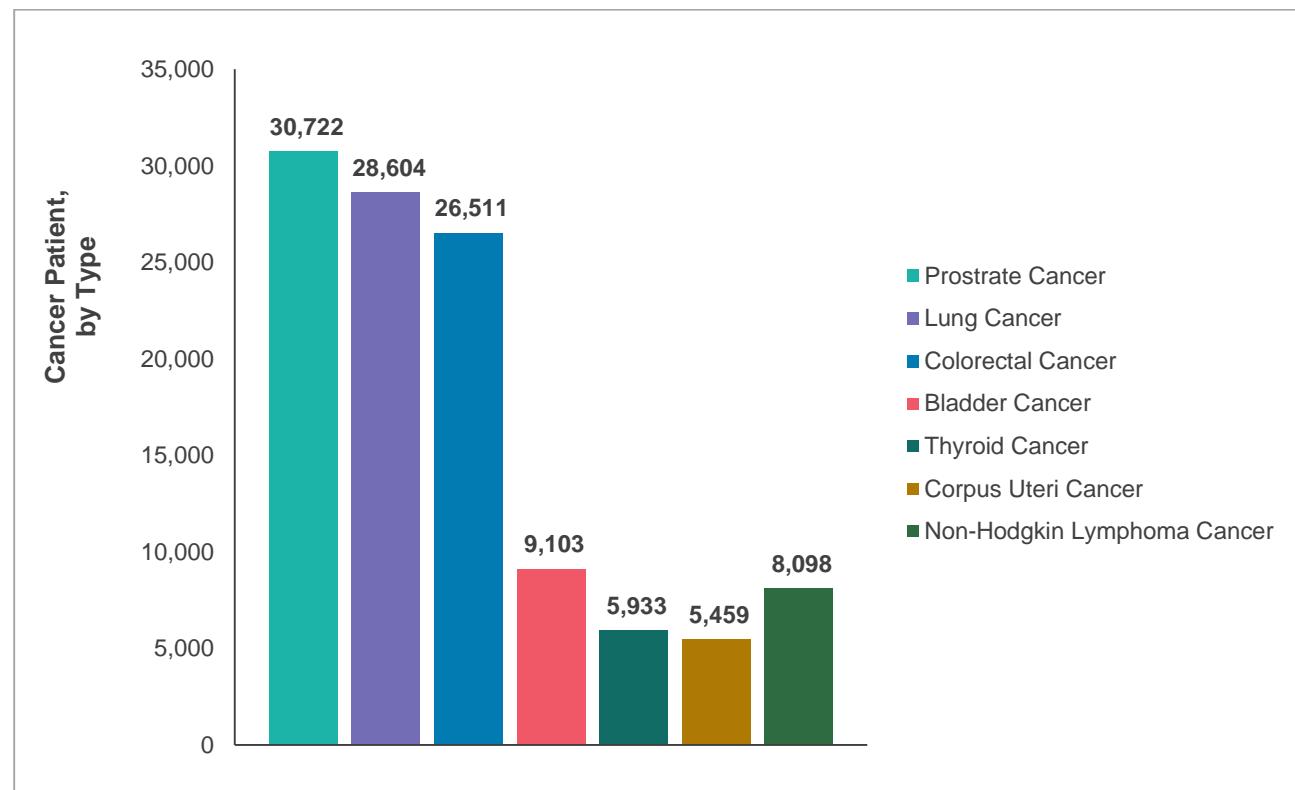
The Canadian market faces a lot of challenges such as:

- The lack of a global medical device OEM in Canada is a challenge for the local imaging equipment companies seeking to reach the world market.
- Expensive processes of clinical trials prevent the Canadian companies from reaching the stage of development that is necessary to attract the interest of major OEMs.
- Canada has a stringent regulatory environment regarding approvals of products and services. For instance, if any of the new imaging technologies has already received an approval for clinical use in other markets, it still needs to be re-approved by Health Canada, which can take several months or even years.
- As compared to the U.S, Canada lacks sufficient medical imaging infrastructure to test the technologies developed by local companies and researchers.
- In Canada, clinical trials are conducted after a product is launched. However, for medical imaging equipment, trials should ideally take place one or two years before the product launch. Canada's regulatory restrictions make early-stage trials difficult to be conducted.
- However, the establishment of an imaging research or manufacturing division by General Electric Company and Siemens Healthineers, Inc. or other imaging OEM in Canada would create a more accessible path for sales and distribution partnerships.

Table: 7.3 Macro-Economic Factors Driving the Market Growth of Portable Imaging Solutions in Canada (2016-2022)

Factors	2016	2017	2018	2019	2020	2021	2022
Population (\$Million)	36.26	36.63	37.01	37.39	37.76	38.14	38.51
GDP (\$Billion)	1,535.77	1,652.40	1,780.32	1,908.24	2,036.16	2,164.08	2,292.00
Health Insurance Coverage (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Number of Doctors/10,000 Population	25.49	25.59	25.69	25.80	25.90	26.00	26.10
Total Healthcare Market (\$Billion)	160.85	173.69	187.80	202.02	216.33	230.74	245.24
Total Medical Devices Market (\$Billion)	6.70	7.01	7.33	7.67	8.02	8.39	8.78

Source: BIS Research Analysis

Figure: 7.17 Patient Data by Cancers Type in the Canada (2016)


Source: BIS Research Analysis

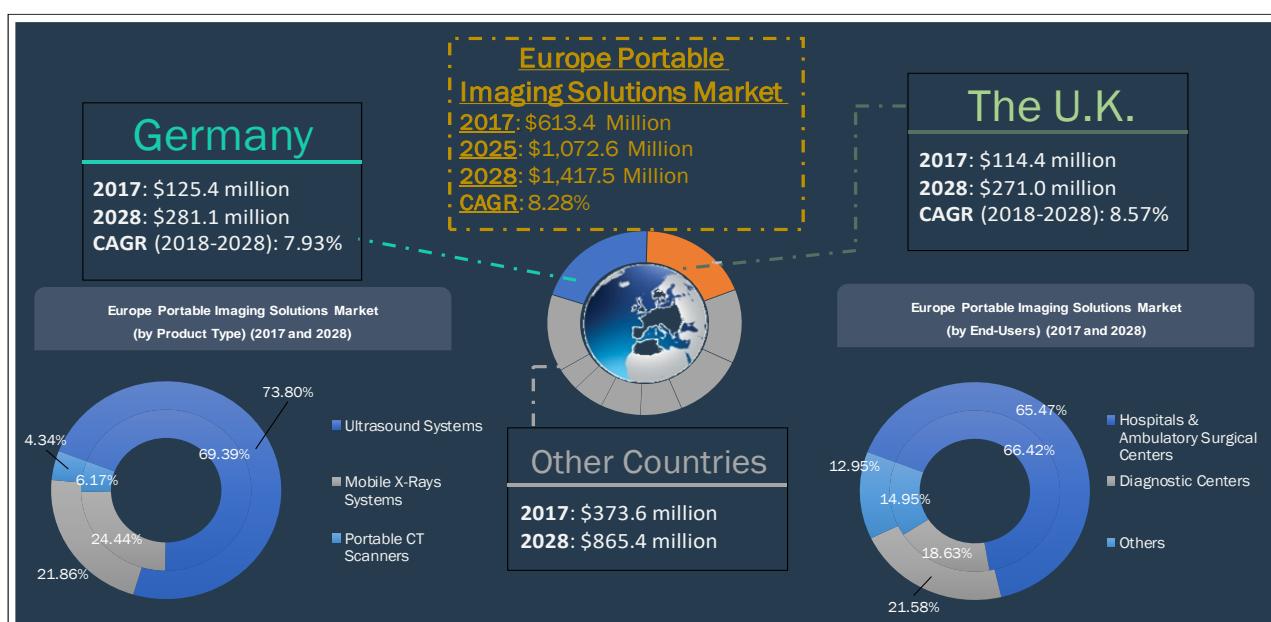
The preceding figure depicts the total number of patients, by different types of cancer in Canada. The rising prevalence and incidence rate of cancer is one of the significant factors influencing the portable imaging solutions market in Canada.

7.3 Europe Portable Imaging Solutions Market

7.3.1 Market Snapshot

This region includes EU5 countries, Nordic countries, BENELUX countries, and Russia, among others. Amongst these countries, Germany acquires the major market share, followed by the U.K. and France. International market players such as General Electric Company and Hitachi, Ltd. have been making significant developments in the region, thus taking the market forward. Moreover, many start-up firms are also seeking expansion in this region.

Figure: 7.18 Market Snapshot: Europe Portable Imaging Solutions Market



Source: BIS Research Analysis

Note: Inner circle represents 2017 market size and outer circle represents 2028 market size

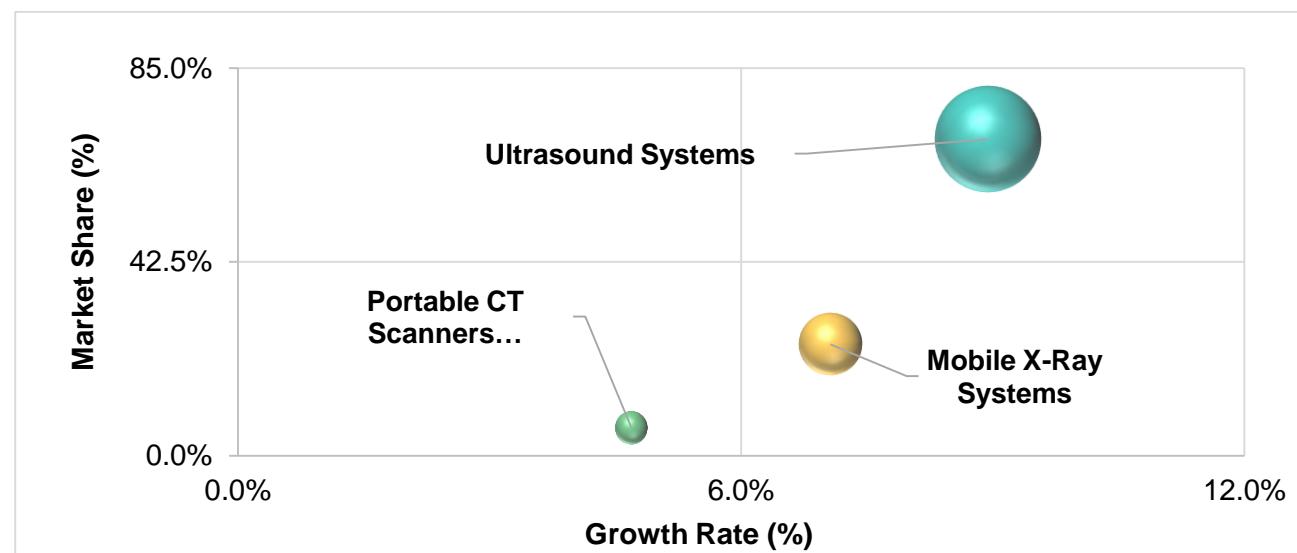
Table: 7.4 Macro-Economic Factors Driving the Market Growth of Portable Imaging Solutions in Europe (2016-2022)

Factors	2016	2017	2018	2019	2020	2021	2022
Population (\$Million)	701.99	705.07	708.24	711.41	714.58	717.75	720.92
GDP (\$Billion)	19,068.74	19,947.14	21,171.18	22,395.44	23,619.94	24,844.66	26,069.63
Health Insurance Coverage (%)	96.15	96.25	96.34	96.44	96.53	96.62	96.72
Number of Doctors/10,000 Population	34.43	34.27	34.11	33.94	33.76	33.59	33.41
Total Healthcare Market (\$Billion)	1,826.54	1,910.53	2,030.89	2,151.76	2,273.13	2,395.01	2,517.40
Total Medical Devices Market (\$Billion)	121.23	127.90	134.75	141.78	149.02	156.46	164.12

Source: BIS Research Analysis

7.3.2 Europe Portable Imaging Solutions Market (by Product Type) (Market Attractiveness Analysis)

Figure: 7.19 Europe: Market Attractiveness Analysis (by Product Type) (2018-2028)



Source: BIS Research Analysis

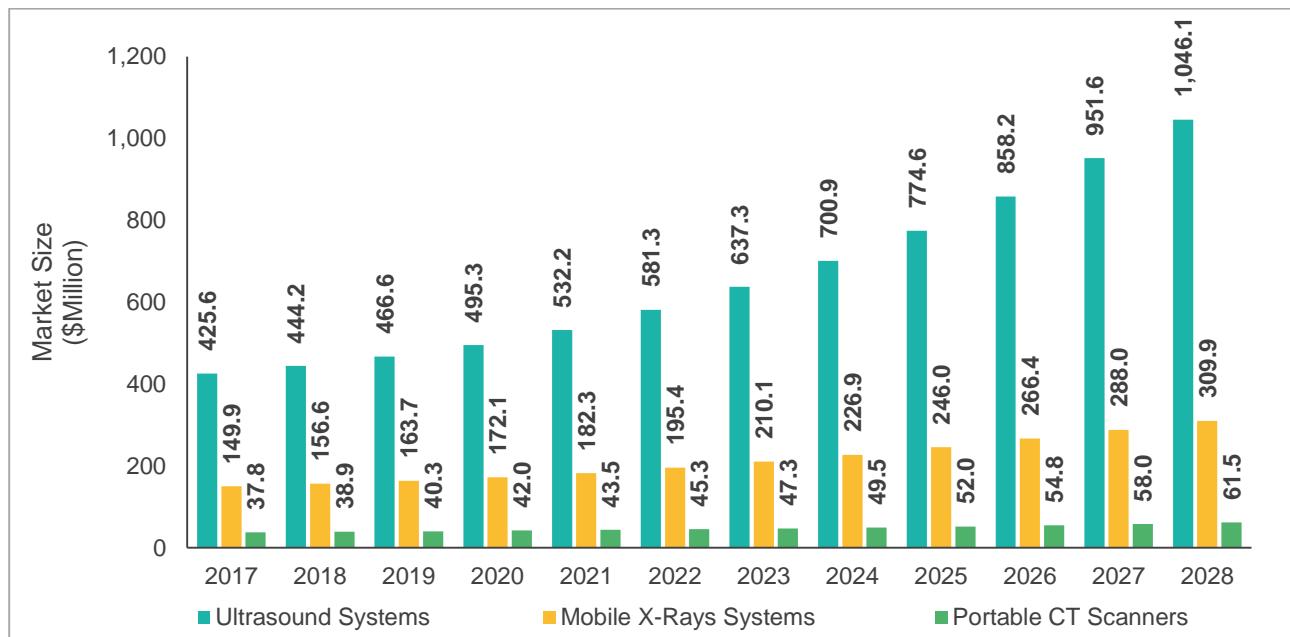
Ultrasound systems segment is the dominating product type segment for Europe portable imaging solutions market. As of 2017, this segment accounted for 69.39% share of the Europe market size, turning in an estimated revenue of \$425.6 million. The above market attractive analysis figure depicts the ultrasound systems segment to have a high market share and a high growth rate. These estimations indicate that the market for ultrasound systems is already sufficient with a huge number of products addressing the respective needs. This segment is growing with a healthy CAGR of 8.94% during the forecast period 2018-2028.

Mobile X-ray systems are the second-most dominating product type segment for Europe portable imaging solutions market. As of 2017, this segment accounted for 24.44% share of the Europe market size, turning in an estimated revenue of \$149.9 million. This segment has become a fast-evolving segment in Europe portable imaging solutions market. The market attractiveness analysis figure given above depicts this segment to have a moderate market share and growth-rate among all other product type segments. These estimations indicate that the market for mobile X-ray systems is rapidly evolving and will sustain the growth with a robust CAGR of 7.07% during the forecast period 2018-2028.

As of 2017, portable CT scanners product type segment accounted for 6.17% share of the Europe market size, turning in an estimated revenue of \$37.8 million. The market attractiveness analysis figure above depicts this segment to have a low-moderate market share and growth-rate among all other product type segments. These estimations indicate that the market for portable CT scanners will sustain the growth of a CAGR of 4.69% during the forecast period 2018-2028.

7.3.3 Europe Portable Imaging Solutions Market (by Product Type)

Europe portable imaging solutions market is foreseen to be majorly driven by active research and development activities in the medical imaging sector, growing public and private sector investments, and an increasing geriatric population. The Europe portable imaging solutions market was valued at \$613.4 million in 2017 and is anticipated to reach \$1,417.5 million by 2028, growing at a CAGR of 8.28% during the forecast period of 2018-2028.

Figure: 7.20 Europe Portable Imaging Solutions Market (by Product Type), 2017-2028


Source: BIS Research Analysis

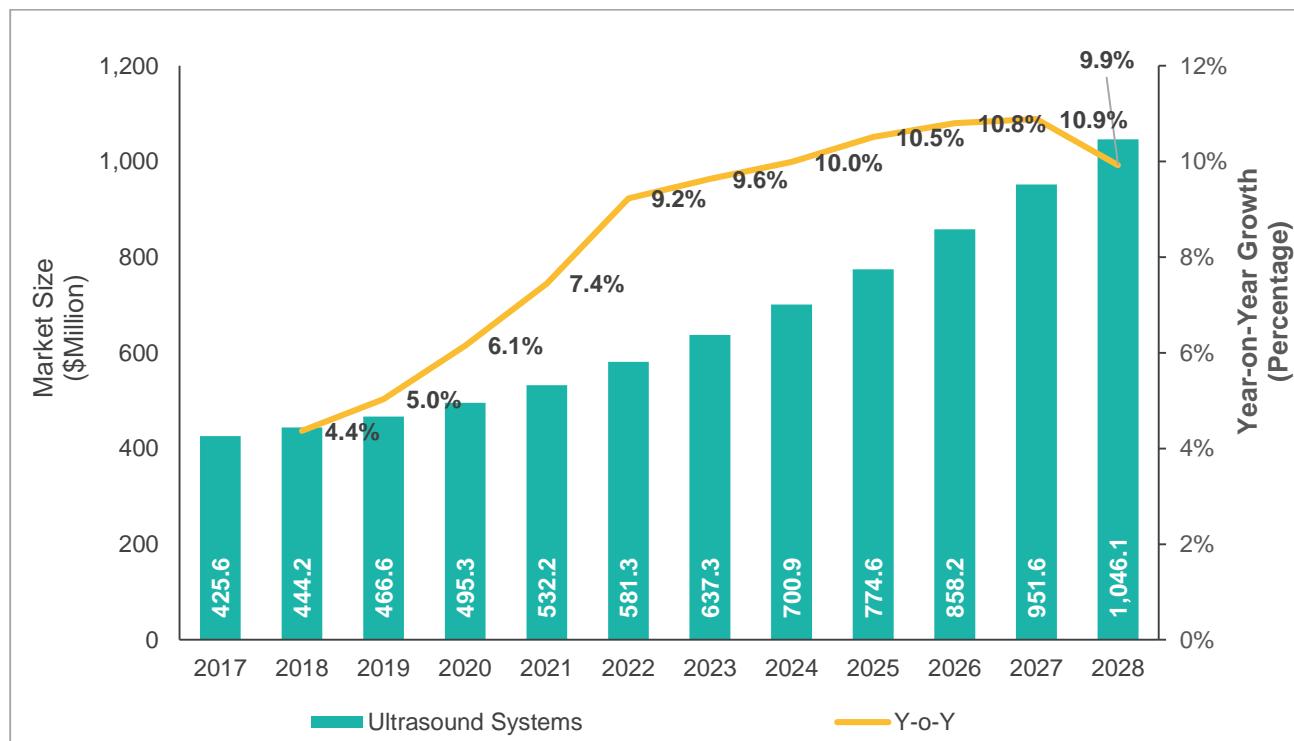
The preceding figure depicts the Europe portable imaging solutions market (by product type), for 2017-2028. As of 2017, the Europe portable imaging solutions market by product type was dominated by ultrasound systems. This segment attributed to 69.39% of the total Europe portable imaging solutions market (by product type) in 2017. Also, ultrasound segment is anticipated to be the fastest growing segment with CAGR of 8.94% from 2018-2028.

In addition to that, the mobile X-ray systems segment was valued at \$149.9 million in 2017 and is estimated to grow to \$309.9 million in 2028 with a CAGR of 7.07% from 2018-2028. Whereas, portable CT scanners segment was valued at \$37.8 million in 2017 and is anticipated to reach \$61.5 million in 2028 with a CAGR of 4.69% from 2018-2028.

The main market in the Europe region includes Germany, UK, France, Italy, and Spain. Europe holds the third largest share in the global portable imaging solutions market. Shortage of skilled radiology professionals, side effects of radiation exposure, and unfavorable taxation, and reimbursement policies are the prime obstacles in the market growth of portable imaging solutions in Europe.

7.3.3.1 Europe Ultrasound Systems Market

Figure: 7.21 Europe Portable Imaging Solutions Market (by Ultrasound Systems), 2017-2028

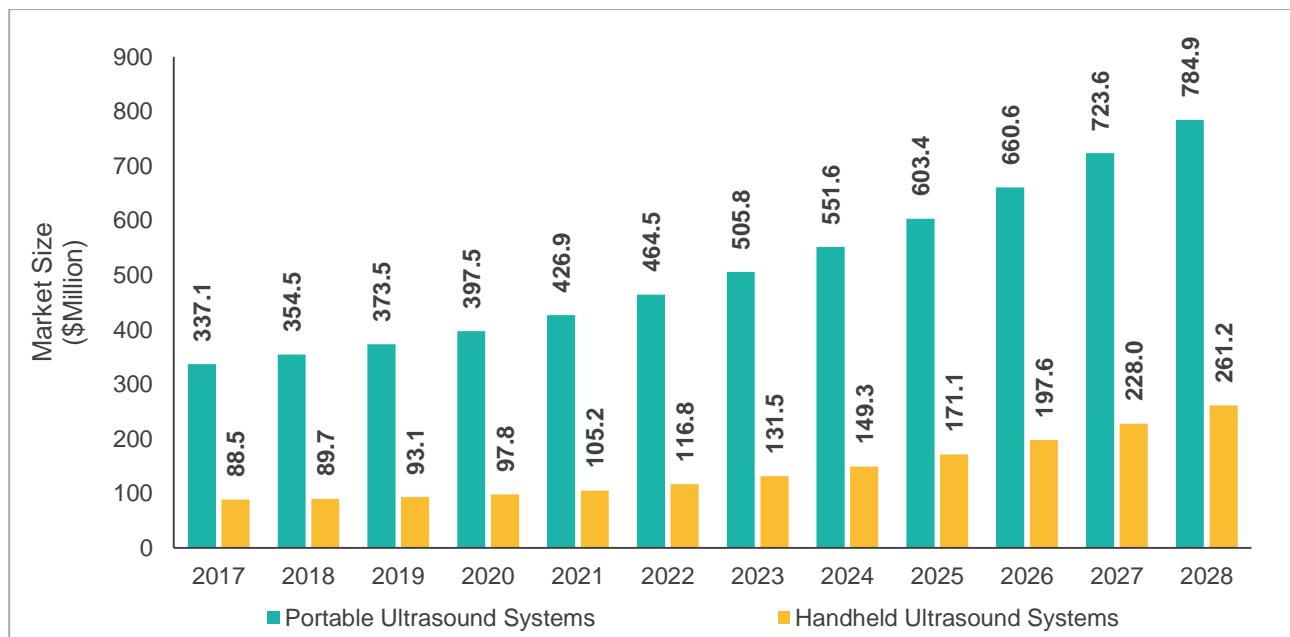


Source: BIS Research Analysis

The preceding figure depicts the Europe portable imaging solutions market (by ultrasound systems), for 2017-2028. The ultrasound segment of the Europe portable imaging solutions market was valued at \$425.6 million in 2017 and is anticipated to reach \$1,046.1 million by 2028, growing at a CAGR of 8.94% during the forecast period 2018-2028. The ultrasound systems segment is the fastest growing segment in Europe portable imaging solutions market.

The integration of diagnostic imaging modalities with the Artificial Intelligence (AI) has opened a new horizon for medical device manufacturers and healthcare providers. The implementation of these technologies in the ultrasound systems has resulted in offering 3D images of the scanning.

Figure: 7.22 Europe Portable Imaging Solutions Market (by Portable Ultrasound Systems and Handheld Ultrasound Systems), 2017-2028



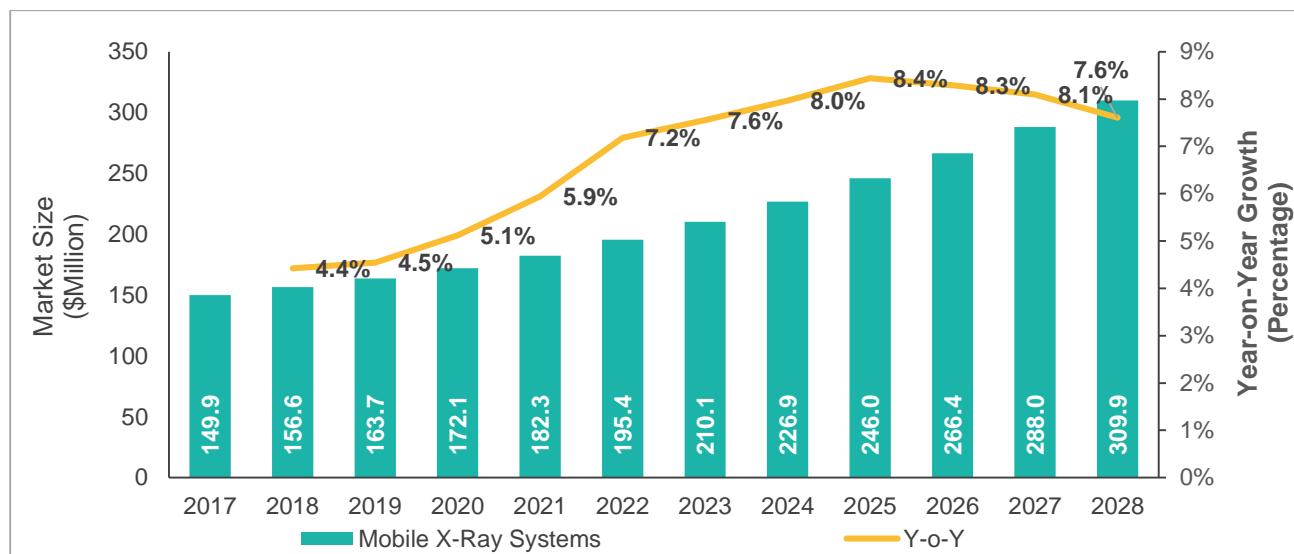
Source: BIS Research Analysis

The preceding figure depicts the Europe portable imaging solutions market (by portable ultrasound systems and handheld ultrasound systems), for 2017-2028. The Europe portable ultrasound systems market was estimated to have a value of \$337.1 million, in 2017. The market is expected to grow at a CAGR of 8.27% during the forecast period 2018-2028 and attain a value of \$784.9 million by 2028. Whereas, handheld ultrasound systems market is anticipated to grow at the fastest rate within the Europe ultrasound systems market attaining a CAGR of 11.28% during the forecast period 2018-2028.

The high growth is attributed to the various technological advancements in the handheld ultrasound systems, including the facility of mobile connectivity now offered by the scanners. Also, these scanners are compatible with the Bluetooth offering wireless connectivity with tablets and mobile for real-time monitoring. The portable systems are more convenient to the traditional ultrasound systems and are expected to eradicate the use of conventional ultrasound systems in the near future.

7.3.3.2 Europe Mobile X-Ray Systems Market

Figure: 7.23 Europe Portable Imaging Solutions Market (by Mobile X-Ray Systems), 2017-2028



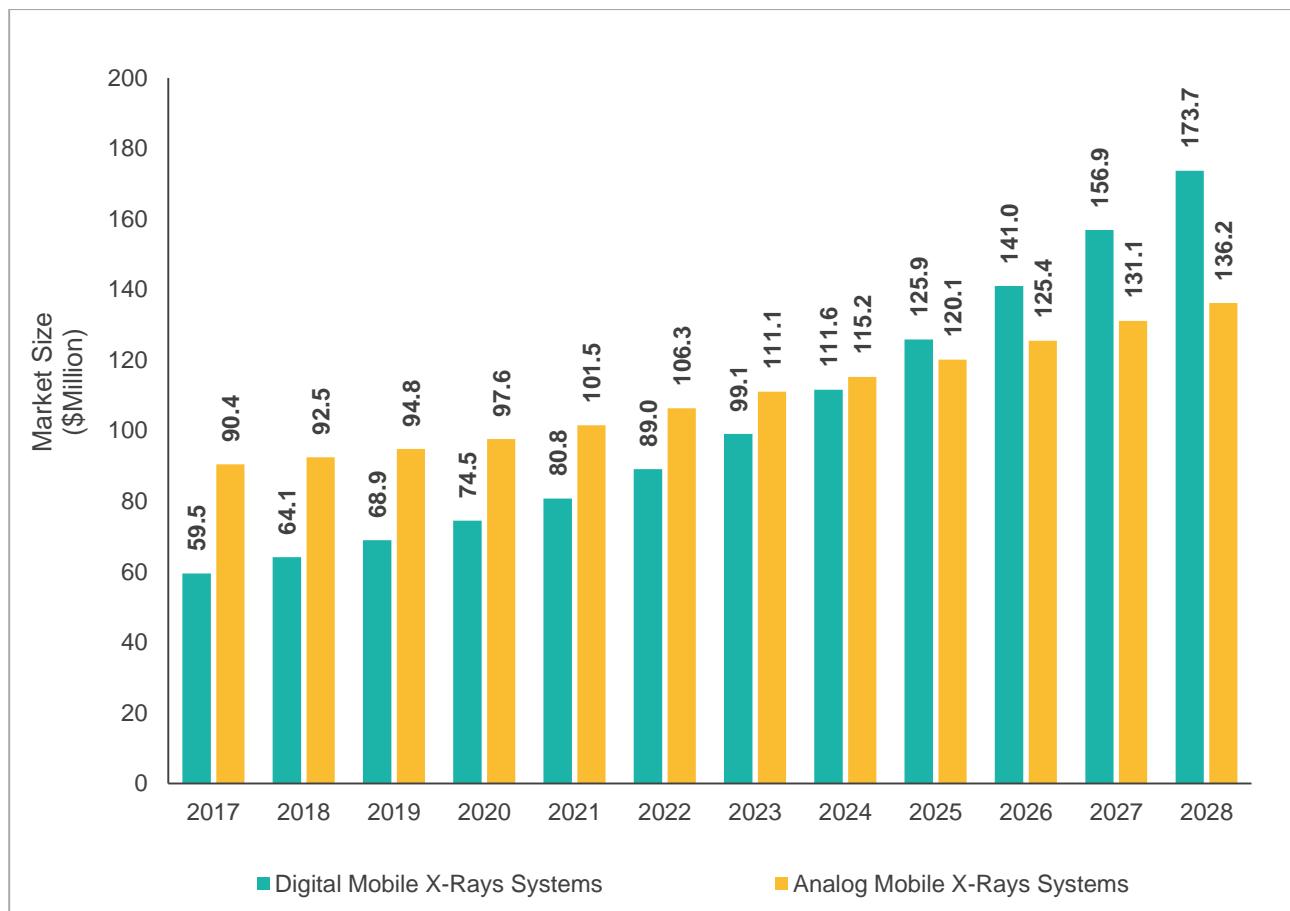
Source: BIS Research Analysis

The preceding figure depicts the Europe portable imaging solutions market (by mobile X-ray system), for 2017-2028. The mobile X-ray systems segment of the Europe portable imaging solutions market was valued at \$149.9 million in 2017 and is anticipated to reach \$309.9 million by 2028, growing at a CAGR of 7.07% during the forecast period of 2018-2028.

The rising prevalence of cancer in the European countries and the utilization of these systems for cancer detection are the prime factors driving the growth of the Europe mobile X-ray systems market. For instance,

- According to the European Commission (EC), cancer is the significant public health burden in the European Union (EU) member states and causes more than a million deaths every year.
- According to the World Cancer Research Fund International (UK), the highest rate of cancer incidence for men and women was found in Denmark with 338 people per 100,000 in 2012. However, Belgium had the highest rate of breast cancer, followed by Denmark and France. Hungary had the highest rate of lung cancer.
- Martinique had the highest rate of prostate cancer, followed by Norway and France. Belgium had the highest rate of bladder cancer cases. These figures are drawing the attention of the European government towards the development and adoption of more advanced cancer detection and diagnosis modalities.

Figure: 7.24 Europe Portable Imaging Solutions Market (by Analog Mobile X-Ray Systems and Digital Mobile X-Ray Systems), 2017-2028

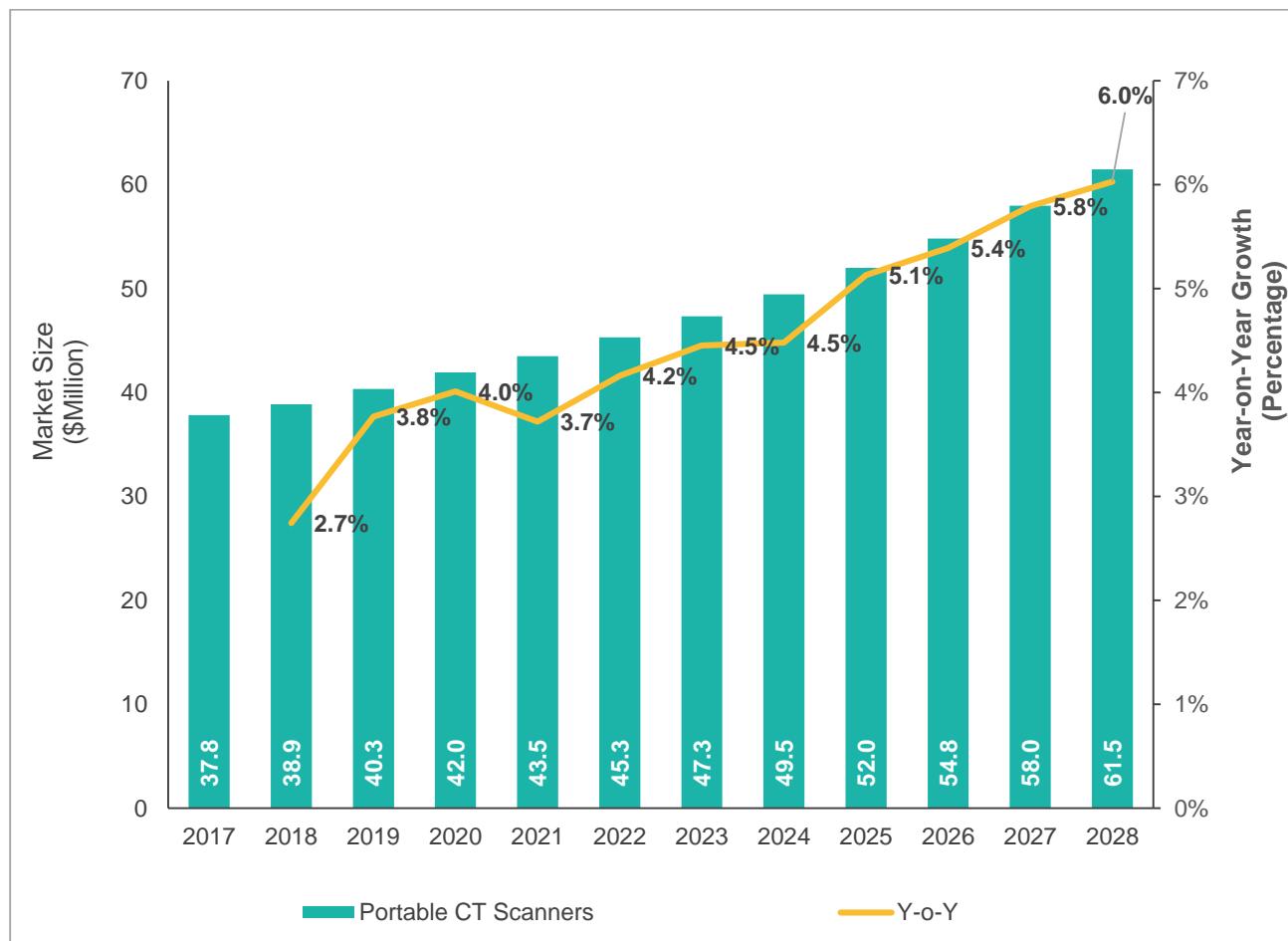


Source: BIS Research Analysis

The preceding figure depicts the Europe portable imaging solutions market (by analog mobile X-ray systems and digital mobile X-ray systems), for 2017-2028. The analog mobile X-ray systems market was estimated to have a value of \$90.4 million, in 2017. The market is expected to grow at a CAGR of 3.95% during the forecast period 2018-2028 and attain a value of \$136.2 million by 2028. Whereas, the digital mobile X-ray systems market is anticipated to grow at the fastest rate within the Europe mobile X-ray systems market attaining a with a CAGR of 10.48% during the forecast period 2018-2028.

7.3.3.3 Europe Portable CT Scanners Market

Figure: 7.25 Europe Portable Imaging Solutions Market (by Portable CT Scanners), 2017-2028

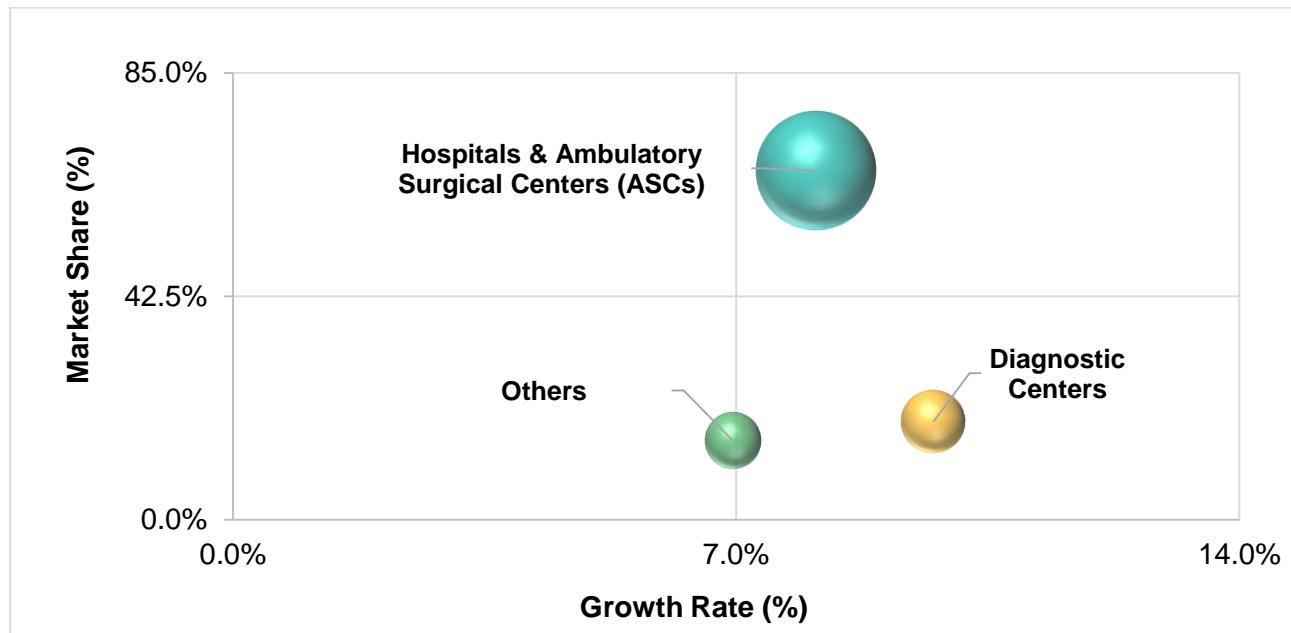


Source: BIS Research Analysis

The preceding figure depicts the Europe portable imaging solutions market (by portable CT scanners), for 2017-2028. The portable CT scanners segment of the Europe portable imaging solutions market was valued at \$37.8 million in 2017 and is anticipated to reach \$61.5 million by 2028, growing at a CAGR of 4.69% during the forecast period of 2018-2028. Europe holds the second largest market share in global portable CT scanners, with 27.69% in 2017.

7.3.4 Europe Portable Imaging Solutions Market (by End-User) (Market Attractiveness Analysis)

Figure: 7.26 Europe: Market Attractiveness Analysis (by End-User) (2018-2028)



Source: BIS Research Analysis

Hospitals and ambulatory surgical centers segment is the dominating end-user segment for Europe portable imaging solutions market. As of 2017, this segment accounted for 66.42% share of the Europe market size, turning in an estimated revenue of \$407.4 million. The market attractive analysis figure given above depicts the hospitals and ambulatory surgical centers segment to have a moderate market share and growth rate. This segment is growing with a CAGR of 8.12% during the forecast period 2018-2028.

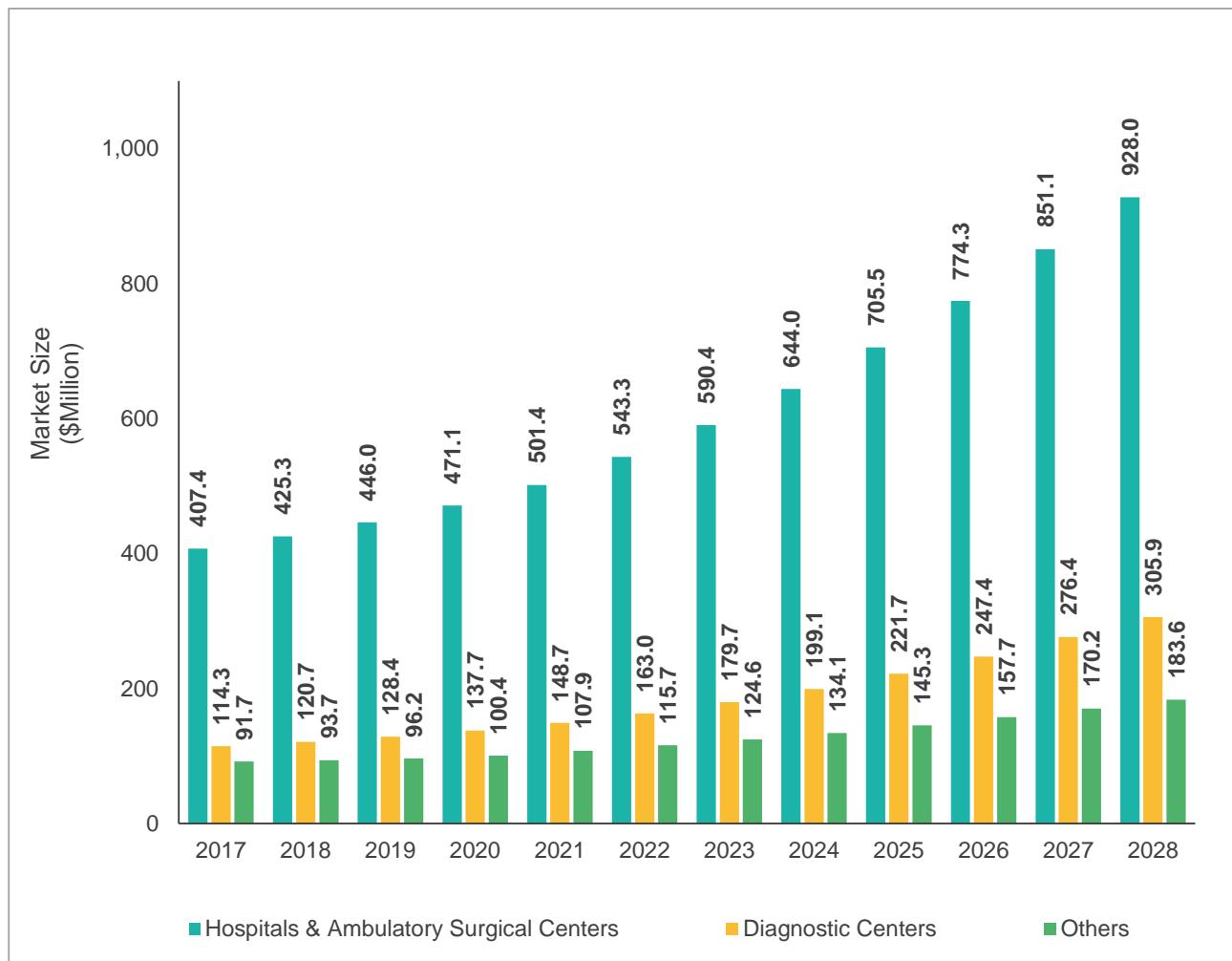
Diagnostic centers segment is the second-most dominating end-user segment for Europe portable imaging solutions market. As of 2017, this segment accounted for 18.63% share of the Europe market size, turning in an estimated revenue of \$114.3 million. This segment has become a fast-evolving segment in the Europe portable imaging solutions market. The market attractiveness analysis figure given above depicts the segment to have a moderate market share and the fastest growth rate of 9.74% during the forecast period 2018-2028.

As of 2017, others end-user segment accounted for 14.95% share of the Europe market size, turning in an estimated revenue of \$91.7 million. The market attractiveness analysis figure above depicts this segment to have a low-moderate market share and growth rate. These estimations indicate that the

market in others end-user segment will sustain the growth of CAGR of 6.96% during the forecast period 2018-2028.

7.3.5 Europe Portable Imaging Solutions Market (by End-User)

Figure: 7.27 Europe Portable Imaging Solutions Market (by End-User), 2017-2028



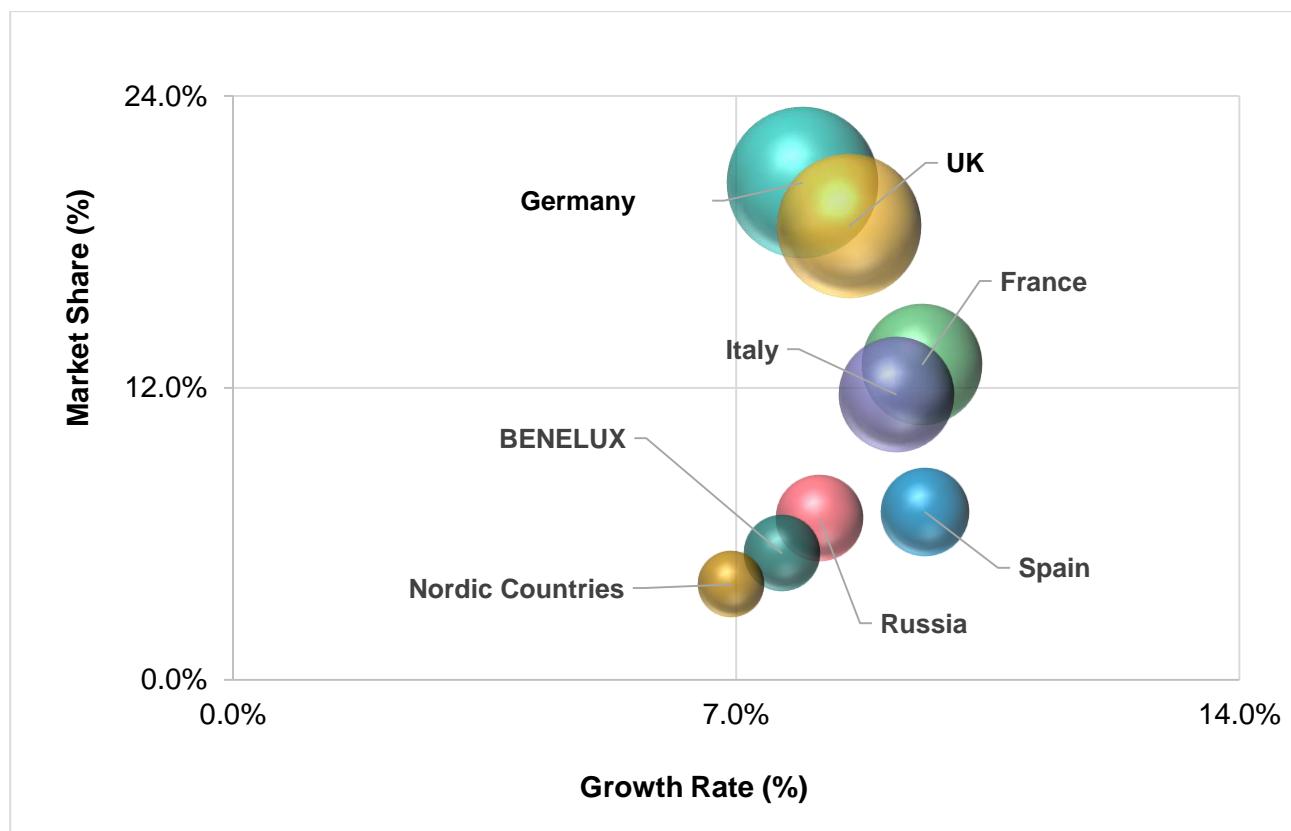
Source: BIS Research Analysis

The preceding figure depicts the Europe portable imaging solutions market (by end-user), for 2017-2028. As of 2017, the Europe portable imaging solutions market by end-users was dominated by hospitals and ambulatory surgical centers. This segment attributed to 66.42% of the total Europe portable imaging solutions market (by end-user) in 2017. Also, hospitals and ambulatory surgical centers segment is anticipated to be the moderate growing segment with CAGR of 8.12% from 2018-2028.

In addition to that, diagnostic centers segment was valued at \$114.3 million in 2017 and is estimated to grow to \$305.9 million in 2028 with a CAGR of 9.74% from 2018-2028, whereas, others end-user segment was valued at \$91.7 million in 2017 and is anticipated to reach \$183.6 million in 2028 with a CAGR of 6.96% from 2018-2028.

7.3.6 Europe Portable Imaging Solutions Market (by Country) (Market Attractiveness Analysis)

Figure: 7.28 Europe: Market Attractiveness Analysis (by Country) (2018-2028)



Source: BIS Research Analysis

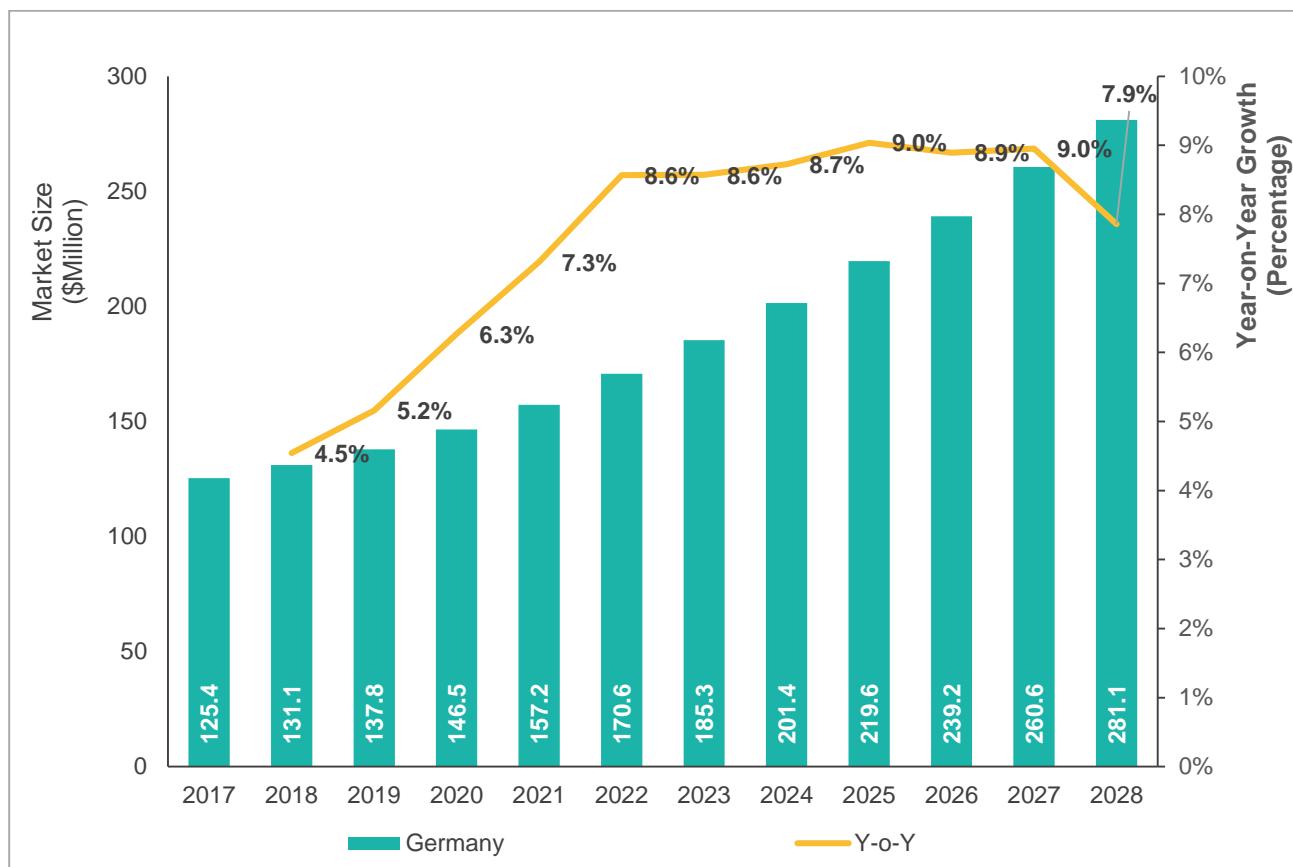
The market attractiveness analysis for Europe portable imaging solutions market has been done for the major contributing countries in the Europe, namely EU5 countries, Russia, Nordic countries, and BENELUX countries.

The Europe region is the third-largest market for portable imaging solutions, accounted for a 25.20% share as of 2017. Globally, France is anticipated to be the fastest growing market for portable imaging solutions, growing at a CAGR of 9.59% during the forecast period 2018-2028. The exponential growth

of this market is being driven by the increasing adoption rate for diagnostic imaging modalities within the country and an increase in the incidences of chronic disorders.

7.3.6.1 Germany

Figure: 7.29 Germany Portable Imaging Solutions Market, 2017-2028



Source: BIS Research Analysis

The preceding figure depicts Germany portable imaging solutions market, for 2017-2028. The Germany portable imaging solutions market was valued at \$125.4 million in 2017 and is anticipated to reach \$281.1 million by 2028, growing at a CAGR of 7.93% during the forecast period 2018-2028. Contrast to other European countries, which are contributing significantly to the Europe portable imaging solutions market, the market for portable imaging solutions in Germany is anticipated to hold the largest market share of 20.44% in 2017.

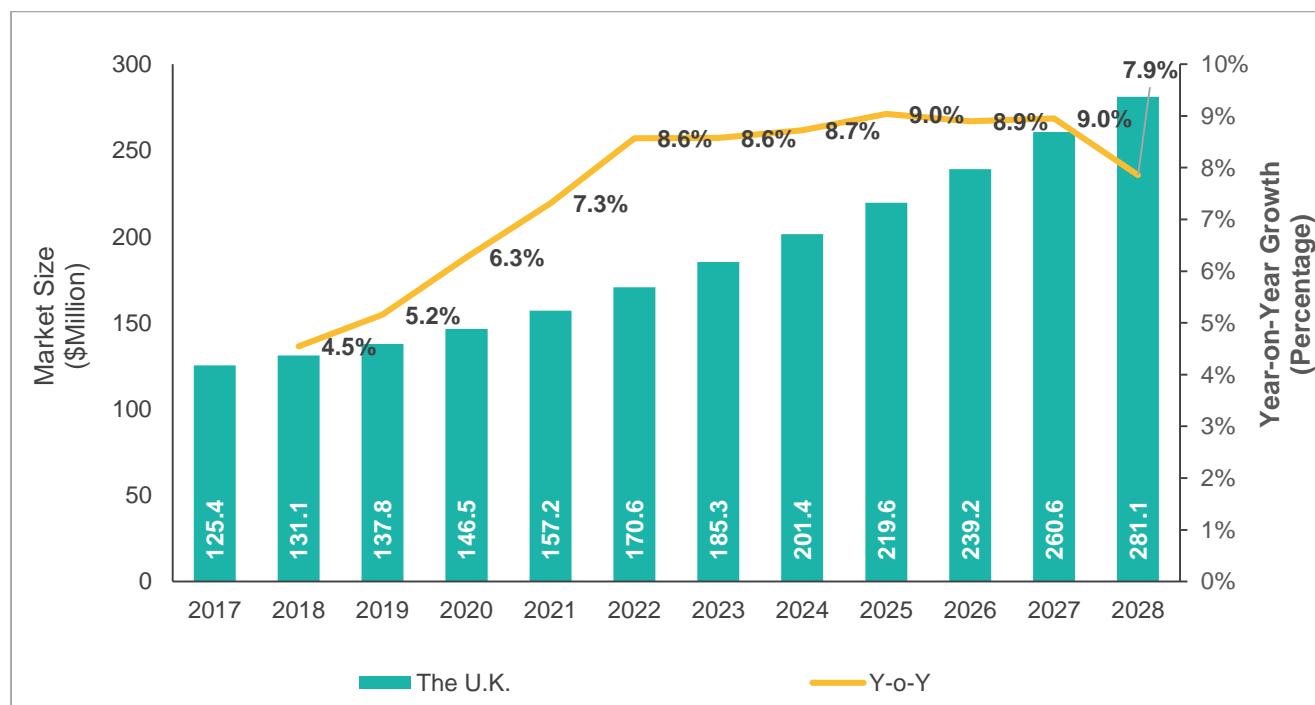
The adoption of portable imaging solutions in the region has witnessed significant growth after 2013. The growing elderly population and rising prevalence and incidence rate of chronic disorders are the leading factors propelling the growth of portable imaging solutions market in Germany.

Table: 7.5 Macro-Economic Factors Driving the Market Growth of Portable Imaging Solutions in Germany (2016-2022)

Factors	2016	2017	2018	2019	2020	2021	2022
Population (\$Million)	82.49	82.60	82.92	83.23	83.54	83.86	84.17
GDP (\$Billion)	3,477.80	3,684.80	3,899.44	4,114.08	4,328.72	4,543.36	4,758.00
Health Insurance Coverage (%)	99.46	99.51	99.57	99.63	99.69	99.74	99.80
Number of Doctors/10,000 Population	41.99	42.08	42.16	42.25	42.33	42.42	42.50
Total Healthcare Market (\$Billion)	388.07	411.42	435.66	459.92	484.22	508.54	532.90
Total Medical Devices Market (\$Billion)	28.40	29.76	31.19	32.69	34.26	35.90	37.63

Source: BIS Research Analysis

7.3.6.2 The U.K.

Figure: 7.30 The U.K. Portable Imaging Solutions Market, 2017-2028


Source: BIS Research Analysis

The preceding figure depicts the U.K. portable imaging solutions market, for 2017-2028. The U.K. portable imaging solutions market was valued at \$125.4 million in 2017 and is anticipated to reach \$281.1 million by 2028, growing at a CAGR of 8.57% during the forecast period 2018-2028. This growth is attributed to the increasing research and development (R&D) activities coupled with the various government initiatives in the U.K. For instance,

- In 2013, NHS established 15 Academic Health Science Networks (AHSNs), to enhance the innovations and advance collaborations across the health value chain in the U.K.
- AHSNs engage collaborations between NHS, industry, academic institutions, or other stakeholders to increase innovation and adoption of the product. Moreover, they also provide expert advice on the advantages of the innovation.

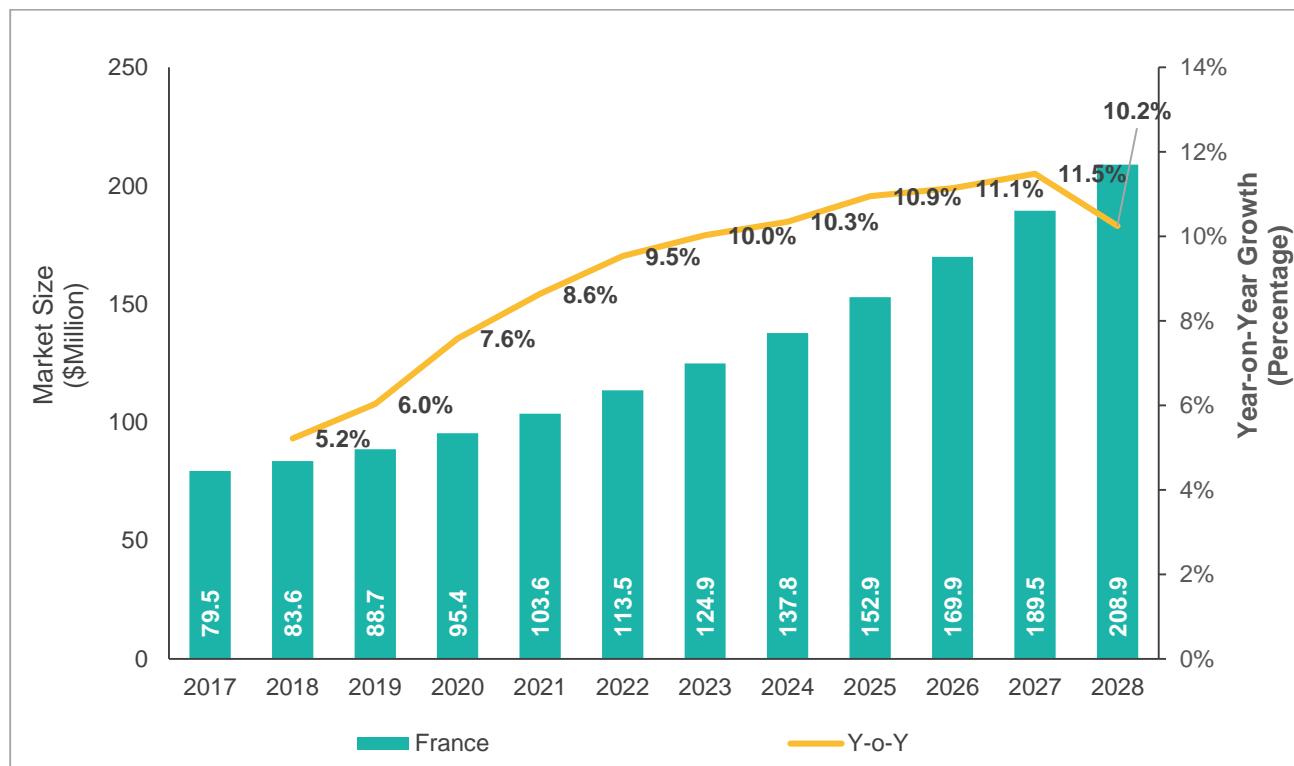
Table: 7.6 Macro-Economic Factors Driving the Market Growth of Portable Imaging Solutions in the U.K. (2016-2022)

Factors	2016	2017	2018	2019	2020	2021	2022
Population (\$Million)	65.60	66.05	66.52	66.99	67.46	67.92	68.39
GDP (\$Billion)	2,650.85	2,624.50	2,769.60	2,914.70	3,059.80	3,204.90	3,350.00
Health Insurance Coverage (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Number of Doctors/10,000 Population	28.25	28.49	28.73	28.98	29.22	29.46	29.70
Total Healthcare Market (\$Billion)	263.04	261.64	277.38	293.26	309.27	325.42	341.70
Total Medical Devices Market (\$Billion)	11.05	11.60	12.18	12.79	13.43	14.10	14.81

Source: BIS Research Analysis

7.3.6.3 France

Figure: 7.31 France Portable Imaging Solutions Market, 2017-2028



Source: BIS Research Analysis

The preceding figure depicts France portable imaging solutions market, for 2017-2028. France is the third largest market of portable imaging solutions in Europe. The market for portable imaging solutions in France is anticipated to grow at a CAGR of 9.59% in the forecast period 2018-2028. In 2017, the market for portable imaging solutions in France was valued to be \$79.5 million and is anticipated to reach \$208.9 million by 2028.

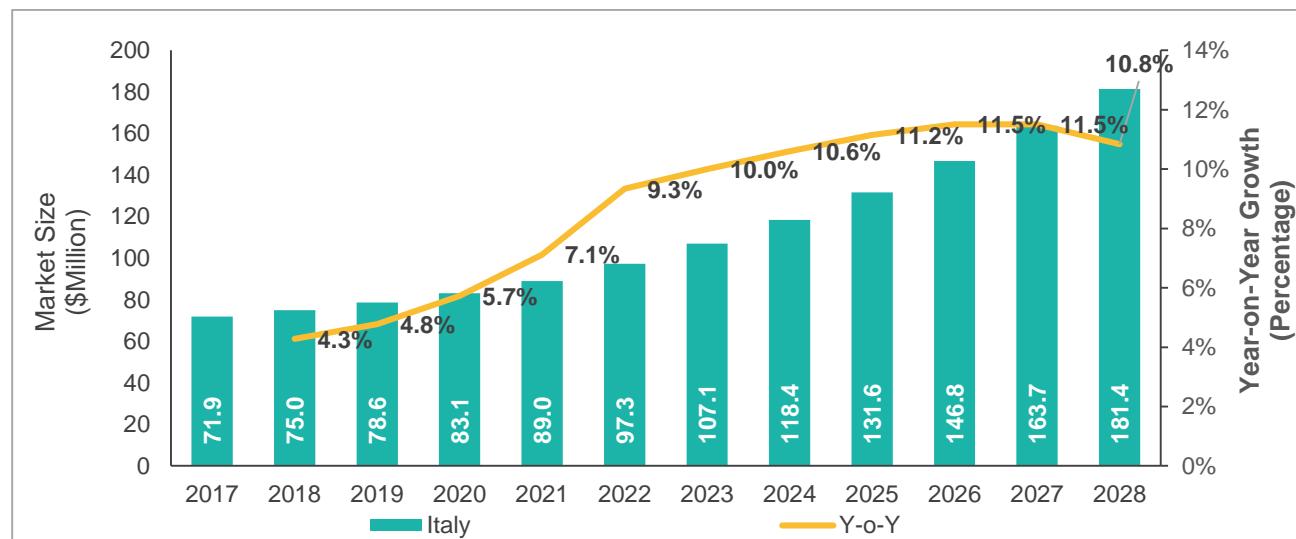
Factors such as rising elderly population, the high prevalence of chronic disorders, and high demand for sophisticated healthcare infrastructure pertaining to technologically advanced products, has significantly propelled the growth of portable imaging solutions in the country.

The inception of technologically advanced products such as digital mobile X-ray systems and handheld ultrasound systems aimed at broadening medical diagnostic applications is expected to bolster the growth of France portable imaging solutions market.

Table: 7.7 Macro-Economic Factors Driving the Market Growth of Portable Imaging Solutions in France (2016-2022)

Factors	2016	2017	2018	2019	2020	2021	2022
Population (\$Million)	66.89	67.24	67.56	67.87	68.19	68.50	68.82
GDP (\$Billion)	2,465.45	2,583.50	2,758.20	2,932.90	3,107.60	3,282.30	3,457.00
Health Insurance Coverage (%)	99.90	99.90	99.90	99.90	99.90	99.90	99.90
Number of Doctors/10,000 Population	32.38	32.62	32.85	33.09	33.33	33.56	33.80
Total Healthcare Market (\$Billion)	273.80	287.92	308.47	329.15	349.97	370.93	392.02
Total Medical Devices Market (\$Billion)	31.50	32.54	33.61	34.72	35.87	37.05	38.27

7.3.6.4 Italy

Figure: 7.32 Italy Portable Imaging Solutions Market, 2017-2028


Source: BIS Research Analysis

The preceding figure depicts Italy portable imaging solutions market, for 2017-2028. Italy is the fourth most significant contributor to the Europe portable imaging solutions market. In 2017, the market for portable imaging solutions in Italy was valued to be \$71.9 million and is anticipated to reach \$181.4 million by 2028, registering a CAGR of 9.23% in the forecast period 2018-2028.

The growing geriatric population aided by the increasing demand for high quality of care is the leading factor promoting the growth of the market for portable imaging solutions in Italy. Several factors such as increasing population, increasing public expectations, and higher life expectancy, are expected to drive the growth of portable imaging solutions in Italy.

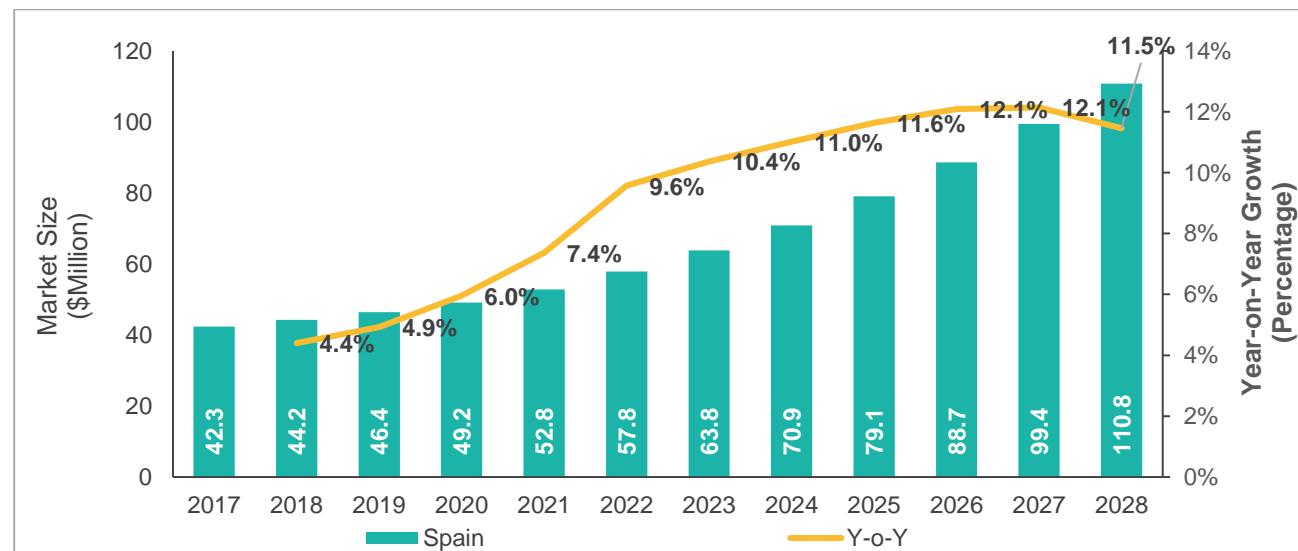
Table: 7.8 Macro-Economic Factors Driving the Market Growth of Portable Imaging Solutions in Italy (2016-2022)

Factors	2016	2017	2018	2019	2020	2021	2022
Population (\$Million)	60.63	61.23	61.51	61.80	62.08	62.37	62.65
GDP (\$Billion)	1,859.38	1,879.84	1,900.52	1,921.42	1,942.56	1,963.92	1,985.53
Health Insurance Coverage (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Number of Doctors/10,000 Population	40.10	40.10	40.10	40.00	39.90	39.90	39.80
Total Healthcare Market (\$Billion)	167.39	169.35	171.33	173.34	175.36	177.42	179.49
Total Medical Devices Market (\$Billion)	8.04	8.32	8.61	8.91	9.23	9.55	9.88

Source: BIS Research Analysis

7.3.6.5 Spain

Figure: 7.33 Spain Portable Imaging Solutions Market, 2017-2028



Source: BIS Research Analysis

The preceding figure depicts Spain portable imaging solutions market, for 2017-2028. Spain is the fifth most significant contributor to the Europe portable imaging solutions market. In 2017, the market for portable imaging solutions in Spain was valued to be \$42.3 million and is anticipated to reach \$110.8 million by 2028, registering a CAGR of 9.62% in the forecast period 2018-2028.

Factors such as increasing privately-insured patient population, increasing acquisitions, and mergers of private hospitals, and aging medical equipment are driving the growth of portable imaging solutions market in Spain. However, factors such as low economic growth, the shortage of skilled personnel, and unregulated reimbursement scenario, are the primary obstacles towards the market growth in Spain.

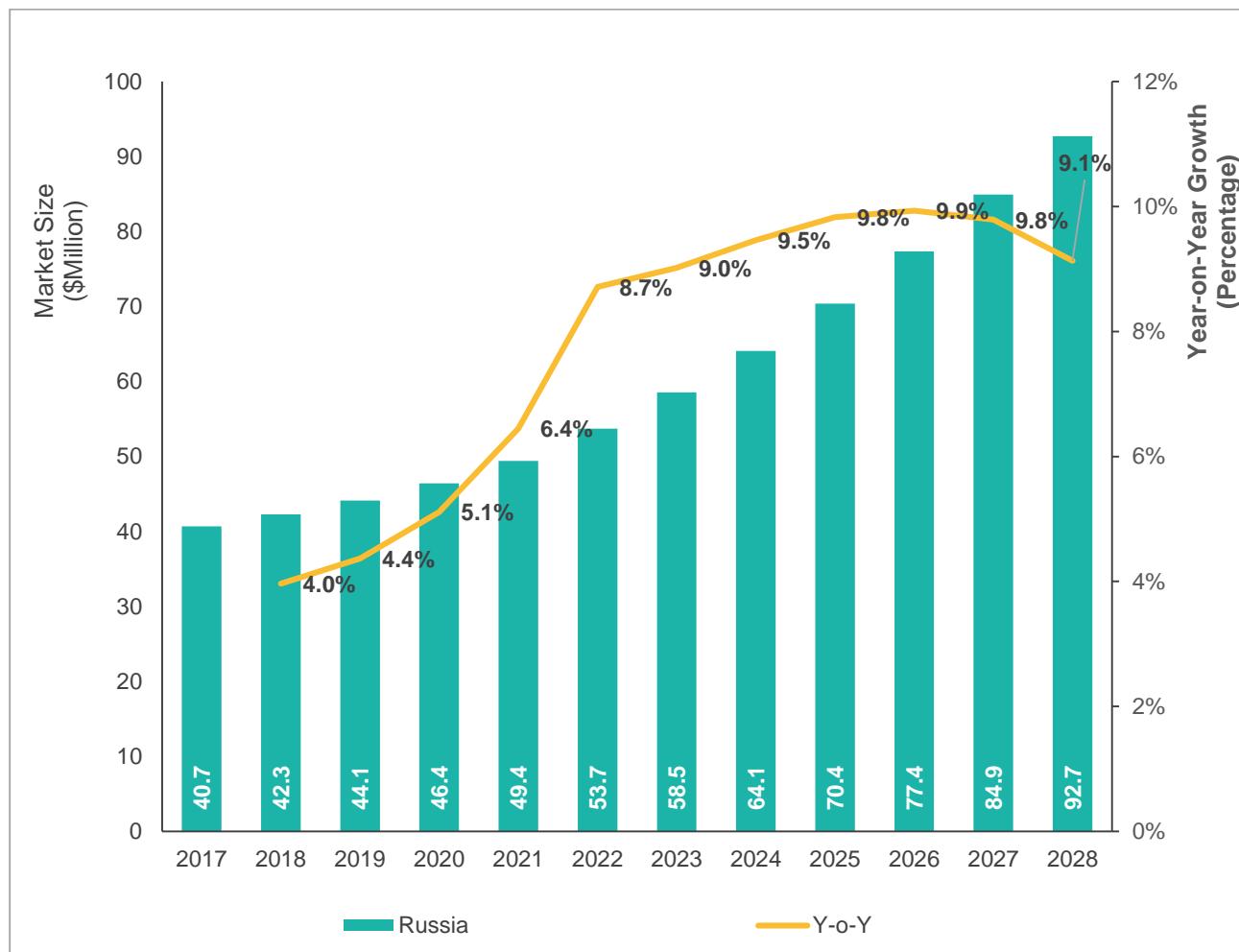
Table: 7.9 Macro-Economic Factors Driving the Market Growth of Portable Imaging Solutions in Spain (2016-2022)

Factors	2016	2017	2018	2019	2020	2021	2022
Population (\$Million)	46.48	46.42	46.38	46.34	46.30	46.26	46.21
GDP (\$Billion)	1,237.26	1,314.00	1,412.00	1,510.00	1,608.00	1,706.00	1,804.00
Health Insurance Coverage (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Number of Doctors/10,000 Population	38.86	39.10	39.34	39.58	39.82	40.06	40.30
Total Healthcare Market (\$Billion)	113.46	120.56	129.62	138.70	147.78	156.87	165.97
Total Medical Devices Market (\$Billion)	7.20	8.25	9.31	10.36	11.41	12.47	13.52

Source: BIS Research Analysis

7.3.6.6 Russia

Figure: 7.34 Russia Portable Imaging Solutions Market, 2017-2028



Source: BIS Research.

The preceding figure depicts Russia portable imaging solutions market, for 2017-2028. The market for portable imaging solutions in Russia is anticipated to grow at a CAGR of 8.16% in the forecast period 2018-2028. In 2017, the market for portable imaging solutions in Russia was valued to be \$40.7 million and is anticipated to reach \$92.7 million by 2028.

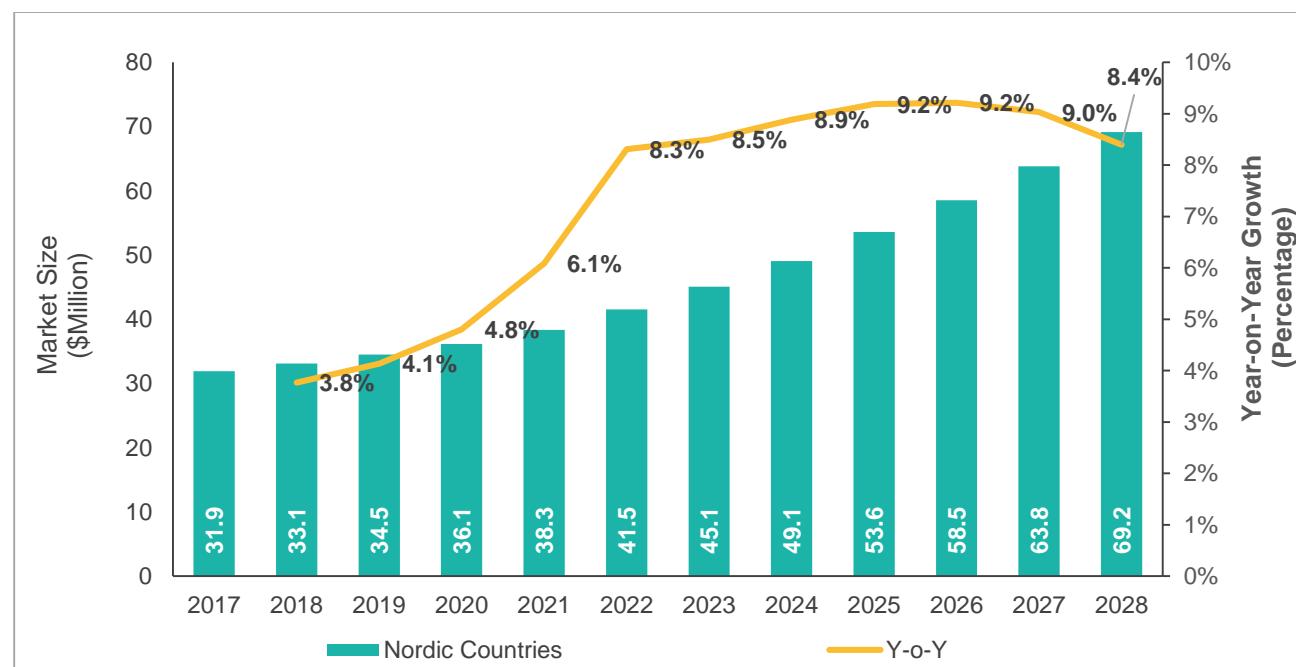
In addition to the high prevalence of chronic disorders, the growing geriatric population has resulted in high demand for technologically advanced products among healthcare providers, aided by the increasing awareness about the sophisticated treatment options and high quality of care among the patient population.

Table: 7.10 Macro-Economic Factors Driving the Market Growth of Portable Imaging Solutions in Russia (2016-2022)

Factors	2016	2017	2018	2019	2020	2021	2022
Population (\$Million)	144.34	144.59	144.86	145.12	145.38	145.65	145.91
GDP (\$Billion)	1,283.16	1,527.00	1,616.00	1,705.00	1,794.00	1,883.00	1,972.00
Health Insurance Coverage (%)	60.00	61.00	62.00	63.00	64.00	65.00	66.00
Number of Doctors/10,000 Population	39.84	39.94	40.03	40.12	40.21	40.31	40.40
Total Healthcare Market (\$Billion)	71.63	85.54	90.85	96.18	101.56	106.96	112.40
Total Medical Devices Market (\$Billion)	5.06	5.33	5.62	5.92	6.24	6.58	6.94

Source: BIS Research Analysis

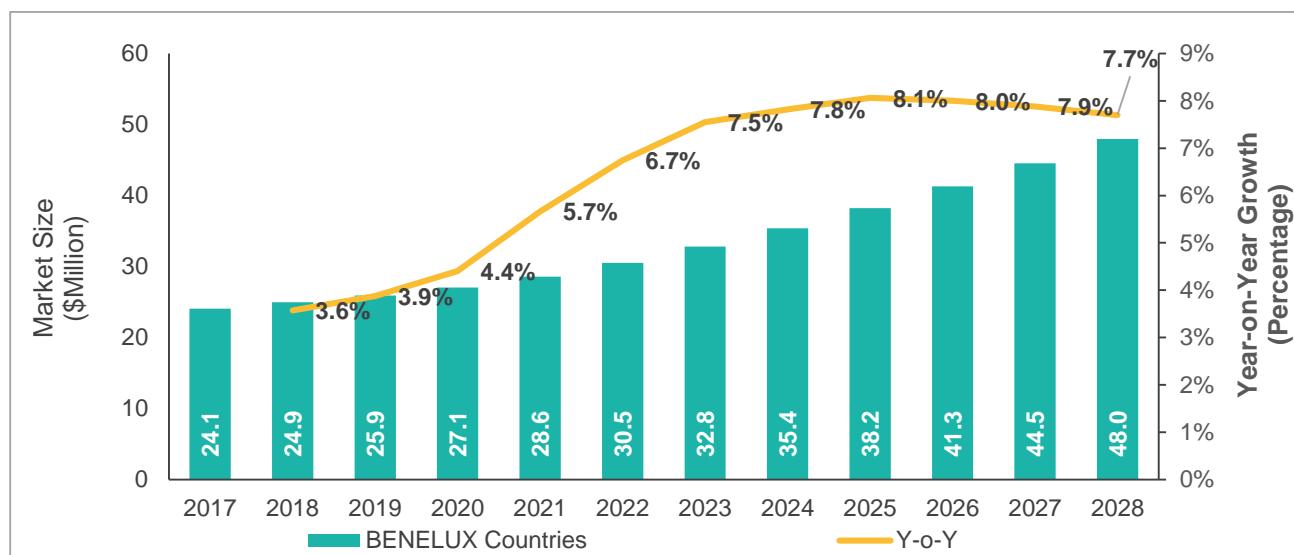
7.3.6.7 Nordic Countries

Figure: 7.35 Nordic Countries Portable Imaging Solutions Market, 2017-2028

Source: BIS Research Analysis

The preceding figure depicts portable imaging solutions market in the Nordic countries, for 2017-2028. The Nordic countries consist of several high potential economies such as Denmark, Finland, Iceland, Norway, and Sweden. The market for portable imaging solutions in Nordic countries is anticipated to grow at a CAGR of 7.64% in the forecast period 2018-2028. In 2017, the market for portable imaging solutions in Nordic countries was valued to be \$31.9 million and is anticipated to reach \$69.2 million by 2028. Owing to the bureaucratic healthcare system of the countries, the medical devices enabling imaging diagnosis to have gained widespread prominence across the healthcare providers.

7.3.6.8 BENELUX Countries

Figure: 7.36 BENELUX Countries Portable Imaging Solutions Market, 2017-2028



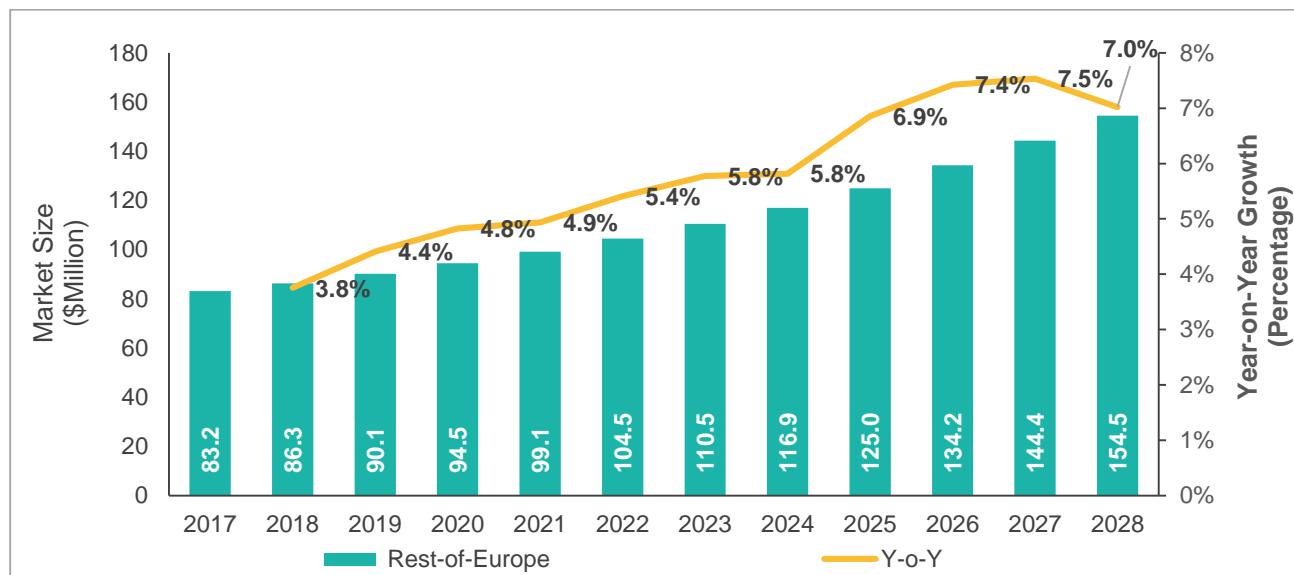
Source: BIS Research Analysis

The preceding figure depicts BENELUX countries portable imaging solutions market, for 2017-2028. The BENELUX countries consist of several potential economies such as Belgium, Luxemburg, and the Netherlands.

The market for portable imaging solutions in BENELUX countries is anticipated to grow at a CAGR of 6.76% in the forecast period 2018-2028. In 2017, the market for portable imaging solutions in BENELUX countries was valued to be \$24.1 million and is anticipated to reach \$48.0 million by 2028. The portable imaging solutions market in BENELUX countries is anticipated to show moderate growth in the forecast period 2018-2028, owing to the factors such as uncertainty in the reimbursement policies and lack of skilled radiology professionals.

7.3.6.9 Rest-of-Europe

Figure: 7.37 Rest-of-Europe Portable Imaging Solutions Market, 2017-2028



Source: BIS Research Analysis

The preceding figure depicts rest-of-Europe portable imaging solutions market, for 2017-2028. The rest-of-Europe consist of several potential economies such as the Czech Republic, Poland, Croatia, Austria, and Belarus, among others.

The market for portable imaging solutions in rest-of-Europe is anticipated to grow at a CAGR of 6.00% in the forecast period 2018-2028. In 2017, the market for portable imaging solutions in rest-of-Europe was valued to be \$83.2 million and is anticipated to reach \$154.5 million by 2028.

The significant growth is attributed to the rising awareness about the benefits of technologically advanced products, aided by the substantial investments made by the key players in marketing strategies to promote the adoption of portable imaging solutions.

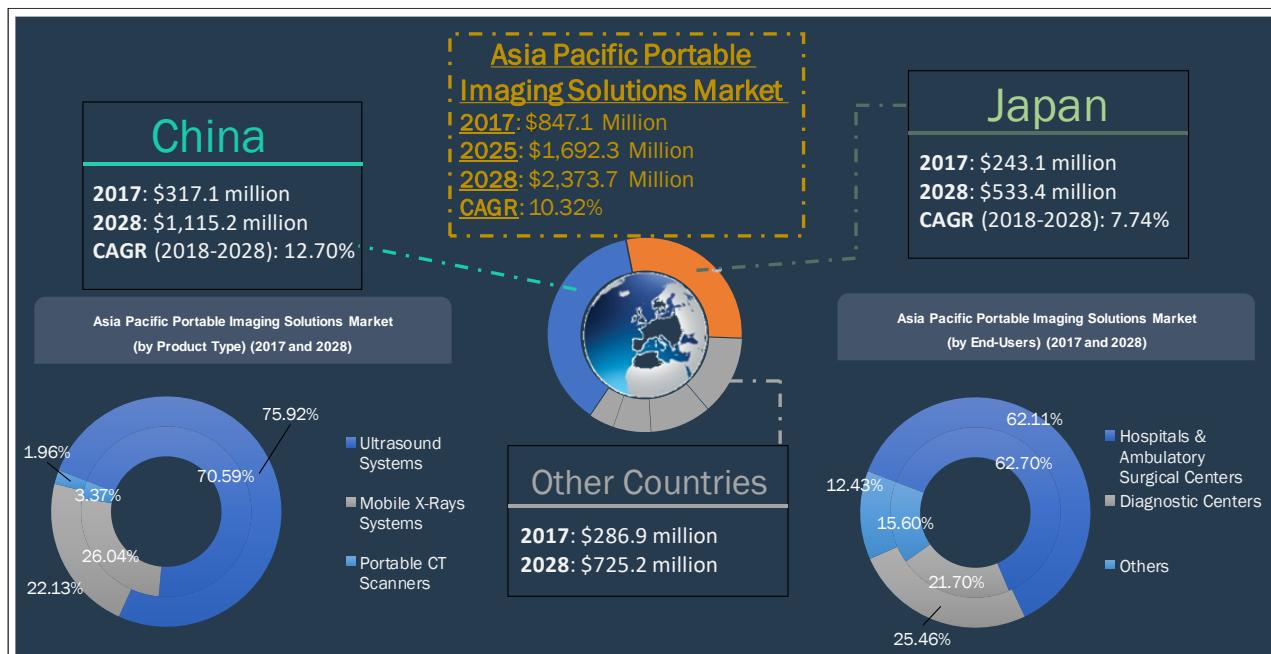
7.4 Asia-Pacific Portable Imaging Solutions Market

7.4.1 Market Snapshot

This region includes China, Japan, South Korea, India, and Australia & New Zealand, among others. Amongst these countries, China acquires the dominant market share, followed by Japan and India. Owing to the presence of the domestic companies such as Konica Minolta, Inc., Canon, Inc., Fujifilm

Holdings Corporation, and Shimadzu Corporation, among others, Asia-Pacific has been the fastest growing region in terms of innovations and developments.

Figure: 7.38 Market Snapshot: Asia-Pacific Portable Imaging Solutions Market



Source: BIS Research Analysis

Note: Inner circle represents 2017 market size and outer circle represents 2028 market size

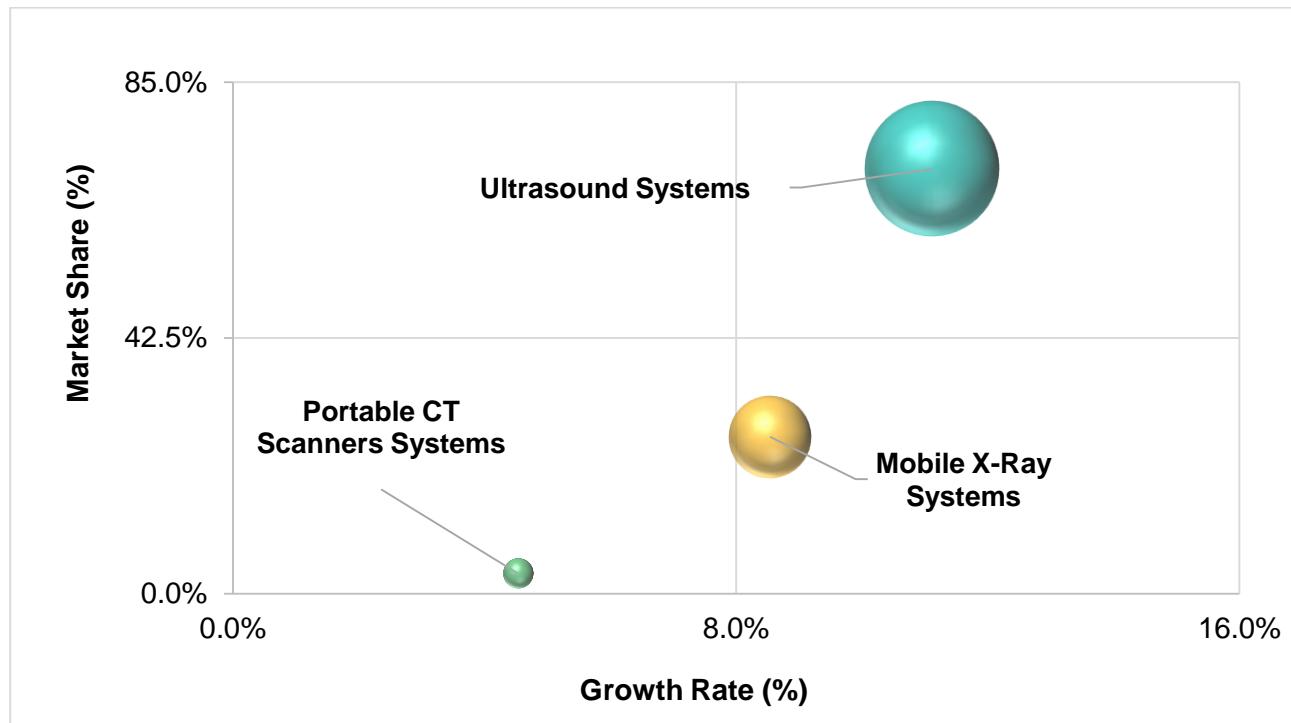
Table: 7.11 Macro-Economic Factors Driving the Market Growth of Portable Imaging Solutions in Asia-Pacific (2016-2022)

Factors	2016	2017	2018	2019	2020	2021	2022
Population (\$Million)	3,863.48	3,898.27	3,933.14	3,968.02	4,002.90	4,037.68	4,072.45
GDP (\$Billion)	25,224.99	26,724.01	28,020.05	29,327.90	30,648.27	31,982.07	33,564.00
Health Insurance Coverage (%)	75.03	75.49	75.94	76.49	76.94	77.39	77.83
Number of Doctors/10,000 Population	19.51	19.69	19.87	20.05	20.23	20.41	20.59
Total Healthcare Market (\$Billion)	1,652.55	1,752.66	1,841.30	1,931.87	2,024.37	2,118.79	2,229.76
Total Medical Devices Market (\$Billion)	110.22	118.19	126.64	135.61	145.12	155.25	166.03

Source: BIS Research Analysis

7.4.2 Asia-Pacific Portable Imaging Solutions Market (by Product Type) (Market Attractiveness Analysis)

Figure: 7.39 Asia-Pacific: Market Attractiveness Analysis (by Product Type) (2018-2028)



Source: BIS Research Analysis

Ultrasound systems segment is the dominating product type segment for Asia-Pacific portable imaging solutions market. As of 2017, this segment accounted for 70.59% share of the Asia-Pacific market size, turning in an estimated revenue of \$598.0 million. The market attractive analysis figure given above depicts this ultrasound systems segment to have a high market share and a high growth rate. These estimations indicate that the market for ultrasound systems is already replete with a huge number of products addressing the respective needs. This segment is growing with a CAGR of 11.08% during the forecast period 2018-2028.

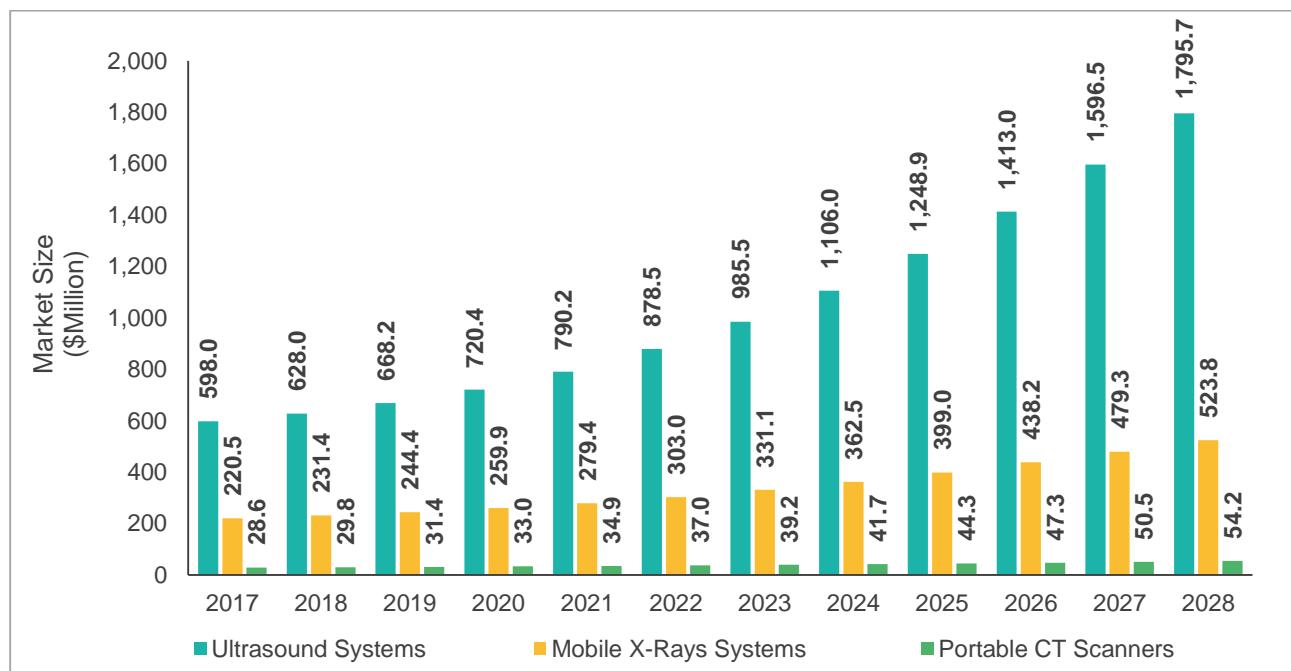
Mobile X-ray systems are the second-most dominating product type segment for Asia-Pacific portable imaging solutions market. As of 2017, this segment accounted for 26.04% share of the Asia-Pacific market size, turning in an estimated revenue of \$220.5 million. This segment has become a fast-evolving segment in the Asia-Pacific portable imaging solutions market. The market attractiveness analysis figure given above depicts this segment to have a moderate market share and growth-rate among all other product type segments. These estimations indicate that the market for mobile X-ray systems is rapidly evolving and will sustain the growth with a robust CAGR of 8.51% during the forecast period 2018-2028.

As of 2017, portable CT scanners product type segment accounted for 3.37% share of the Asia-Pacific market size, turning in an estimated revenue of \$28.6 million. The market attractiveness analysis figure given above depicts this segment to have a low-moderate market share and growth-rate among all other product type segments. These estimations indicate that the market for portable CT scanners will sustain the growth of CAGR of 6.16% during the forecast period 2018-2028.

7.4.3 Asia-Pacific Portable Imaging Solutions Market (by Product Type)

Asia-Pacific portable imaging solutions market is foreseen to be majorly driven by a large population base coupled with the increasing number of elderly population, and various initiatives taken by the government. The Asia-Pacific portable imaging solutions market was valued at \$847.1 million in 2017 and is anticipated to reach \$2,373.7 million by 2028, growing at a CAGR of 10.32% during the forecast period of 2018-2028.

Figure: 7.40 Asia-Pacific Portable Imaging Solutions Market (by Product Type), 2017-2028



Source: BIS Research Analysis

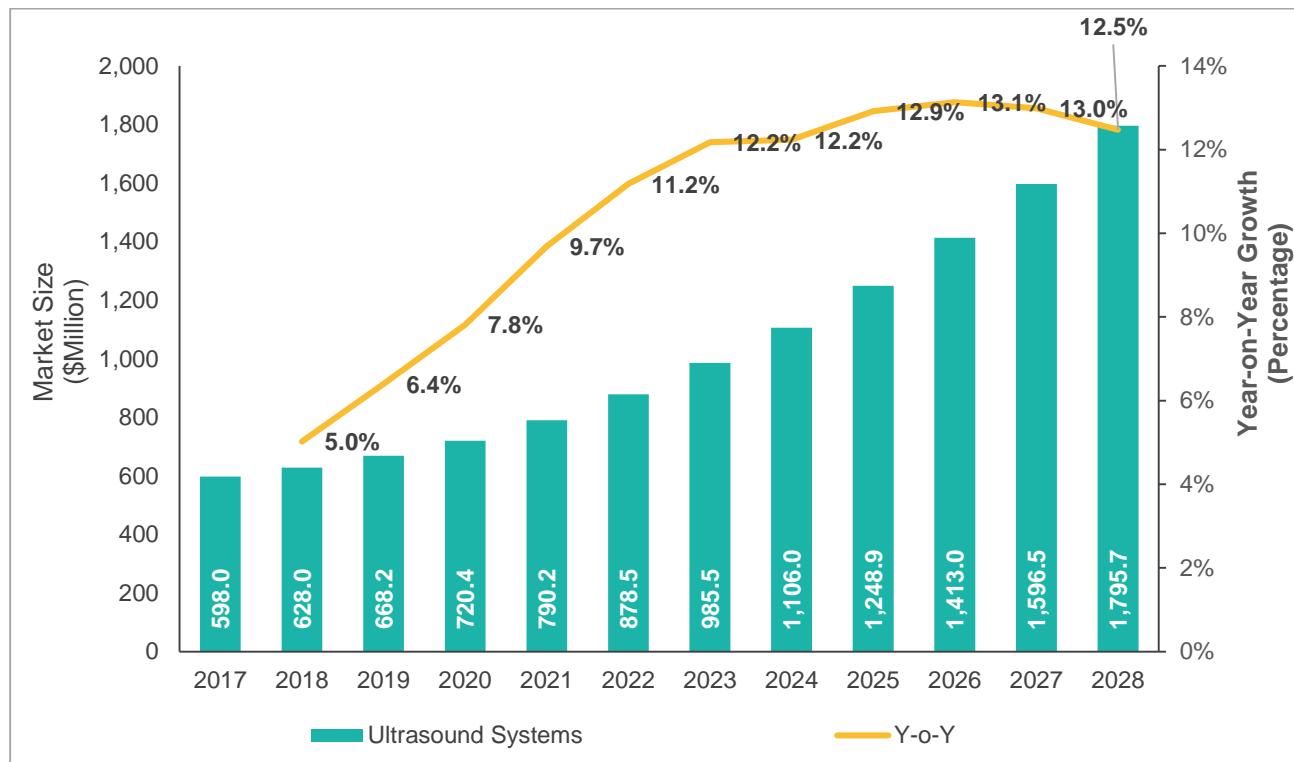
The preceding figure depicts the Asia-Pacific portable imaging solutions market (by product type), for 2017-2028. As of 2017, the Asia-Pacific portable imaging solutions market by product type was dominated by ultrasound systems. This segment attributed to 70.59% of the total Asia-Pacific portable imaging solutions market (by product type) in 2017. Also, ultrasound segment is anticipated to be the fastest growing segment with CAGR of 11.08% from 2018-2028.

In addition to that, the mobile X-ray systems segment was valued at \$220.5 million in 2017 and is estimated to grow to \$523.8 million in 2028 with a CAGR of 8.51% from 2018-2028. Whereas, portable CT scanners segment was valued at \$28.6 million in 2017 and is anticipated to reach \$54.2 million in 2028 with a CAGR of 6.16% from 2018-2028.

The primary market in the Asia-Pacific region includes China, Japan, India, and South Korea, among others. The Asia-Pacific holds the largest share in the global portable imaging solutions market, owing to the enormous amount of data present in the market because of the rising population. China and India are the most populated regions in the world which makes them more susceptible to chronic disorders.

7.4.3.1 Asia-Pacific Ultrasound Systems Market

Figure: 7.41 Asia-Pacific Portable Imaging Solutions Market (by Ultrasound Systems), 2017-2028

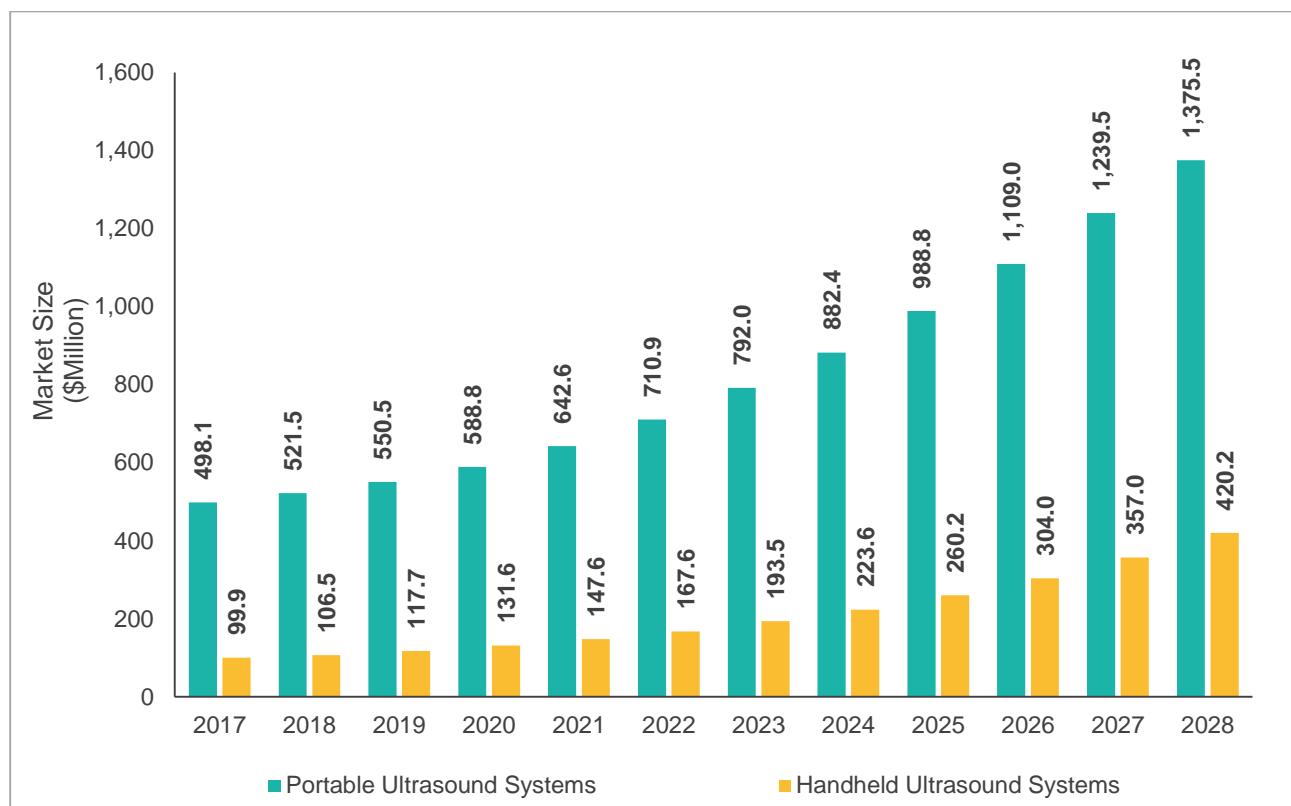


Source: BIS Research Analysis

The preceding figure depicts the Asia-Pacific portable imaging solutions market (by ultrasound systems), for 2017-2028. The ultrasound segment of the Asia-Pacific portable imaging solutions market was valued at \$598.0 million in 2017 and is anticipated to reach \$1,795.7 million by 2028, growing at a CAGR of 11.08% during the forecast period 2018-2028.

The ultrasound systems are the fastest growing segment in Asia-Pacific portable imaging solutions market, owing to the increasing disposable income, education on the importance of early screening by various governmental agencies and NGOs, and rising incidence rate of chronic disorders are some of the factors driving the growth of this market in the Asia-Pacific region.

Figure: 7.42 Asia-Pacific Portable Imaging Solutions Market (by Portable Ultrasound Systems and Handheld Ultrasound Systems), 2017-2028



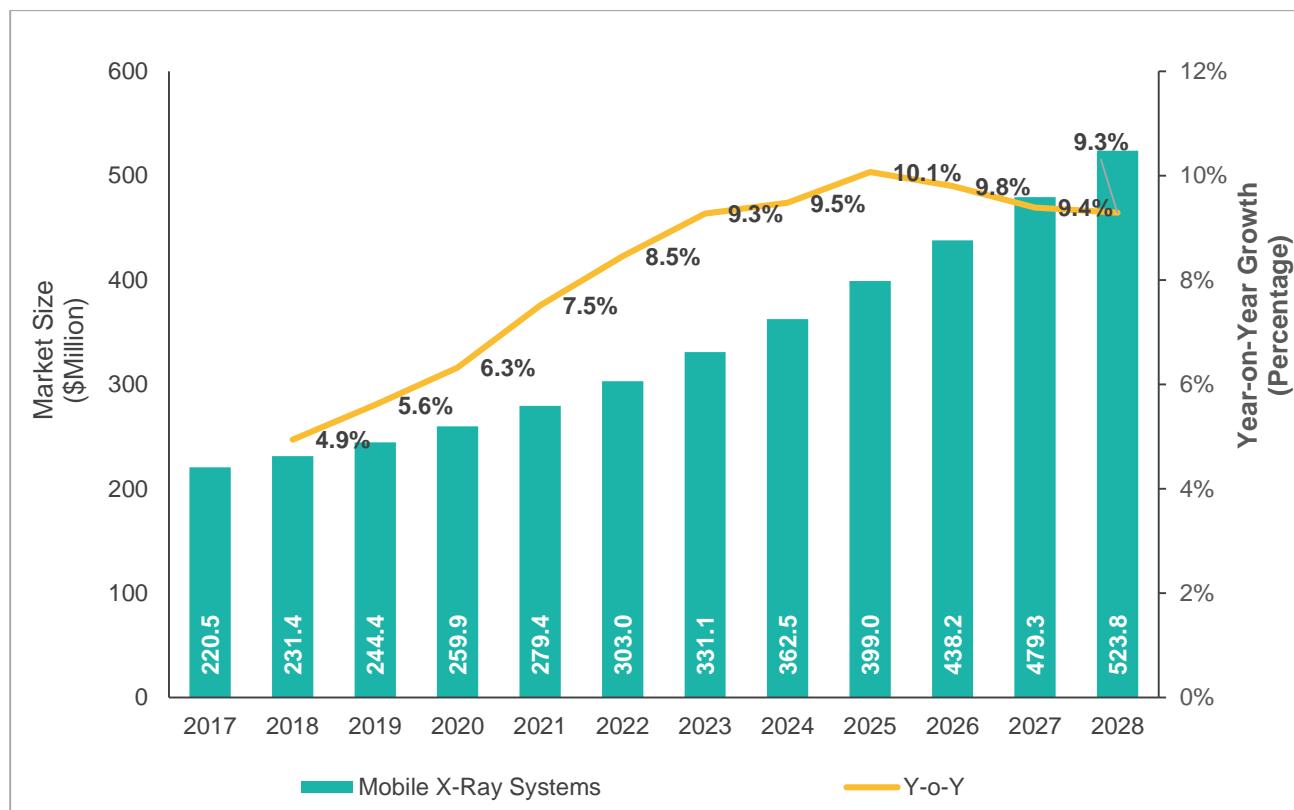
Source: BIS Research Analysis

The preceding figure depicts the Asia-Pacific portable imaging solutions market (by portable ultrasound systems and handheld ultrasound systems), for 2017-2028. The Asia-Pacific portable ultrasound systems market was estimated to have a value of \$498.1 million, in 2017. The market is expected to grow at a CAGR of 10.18% during the forecast period 2018-2028 and attain a value of \$1,375.5 million by 2028.

Whereas, handheld ultrasound systems market is anticipated to grow at the fastest rate within the Asia-Pacific ultrasound systems market attaining a CAGR of 14.71% during the forecast period 2018-2028.

7.4.3.2 Asia-Pacific Mobile X-Ray Systems Market

Figure: 7.43 Asia-Pacific Portable Imaging Solutions Market (by Mobile X-Ray Systems), 2017-2028



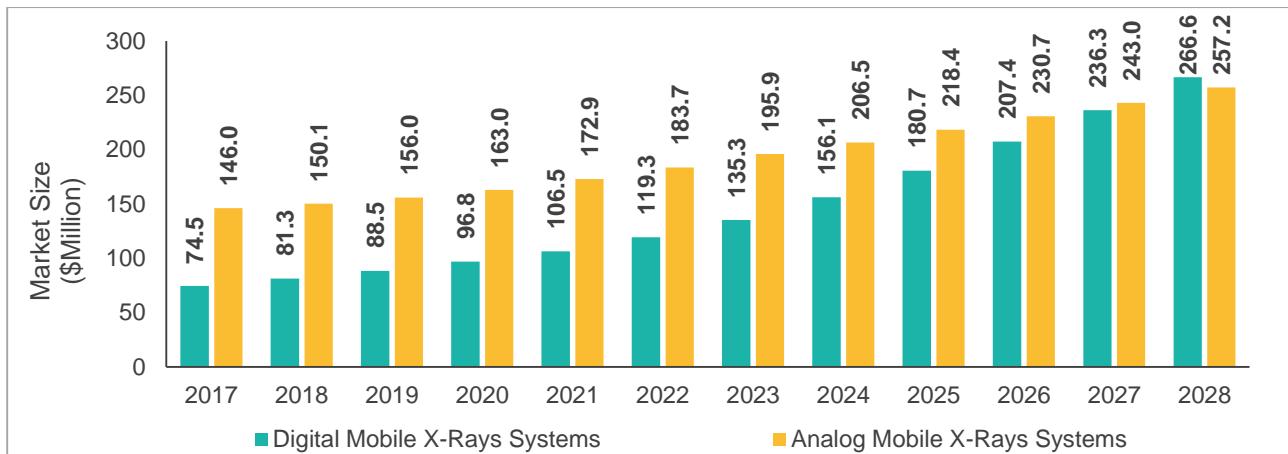
Source: BIS Research Analysis

The preceding figure depicts the Asia-Pacific portable imaging solutions market (by mobile X-ray systems), for 2017-2028. The mobile X-ray systems segment of the Asia-Pacific portable imaging solutions market was valued at \$220.5 million in 2017 and is anticipated to reach \$525.8 million by 2028, growing at a CAGR of 8.51% during the forecast period of 2018-2028.

Rising incidence rate of cancer, continuous technological advancements in the mobile X-ray technologies and active government support are some of the factors for the growth of mobile X-ray systems market in Asia-Pacific region. For instance,

- In 2011, the government in China had ensured providing quality healthcare facilities and had allotted nearly \$124 billion for healthcare services. China has over 28,000 hospitals, 85% of which are publicly owned, and the remaining 15% are private hospitals or China joint venture hospitals. However, the growth of hospitals encourages the development of the medical devices market in China.

Figure: 7.44 Asia-Pacific Portable Imaging Solutions Market (by Analog Mobile X-Ray and Digital Mobile X-Ray Systems), 2017-2028



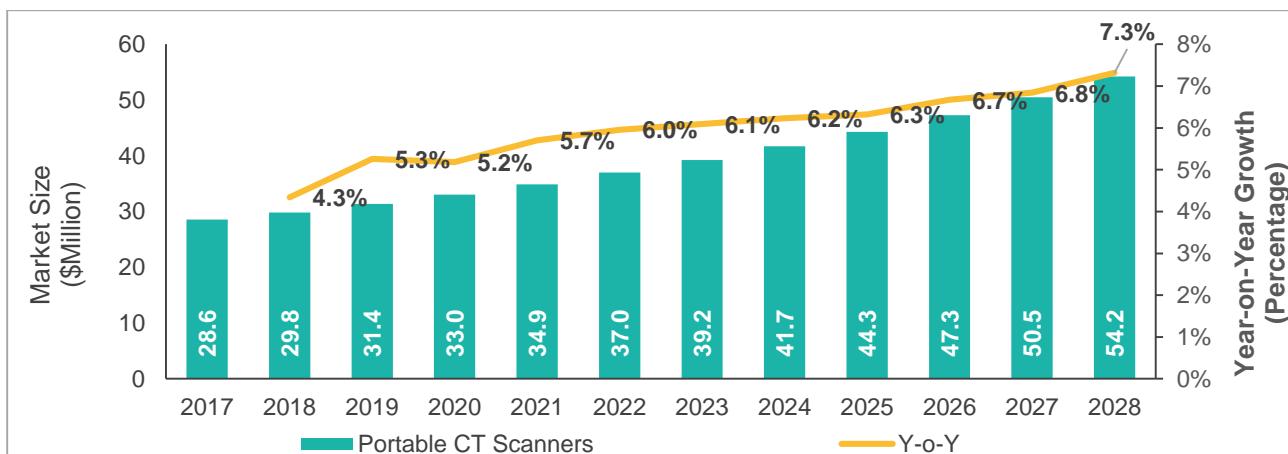
Source: BIS Research Analysis

The preceding figure depicts the Asia-Pacific portable imaging solutions market (by analogy mobile X-ray systems and digital mobile X-ray systems), for 2017-2028. The analog mobile X-ray systems market was estimated to have a value of \$146.0 million, in 2017. The market is expected to grow at a CAGR of 5.53% during the forecast period 2018-2028 and attain a value of \$266.6 million by 2028.

Whereas, the digital mobile X-ray systems market is anticipated to grow at the fastest rate within the Asia-Pacific mobile X-ray systems market attaining a CAGR of 12.61% during the forecast period 2018-2028.

7.4.3.3 Asia-Pacific Portable CT Scanners Market

Figure: 7.45 Asia-Pacific Portable Imaging Solutions Market (by Portable CT Scanners), 2017-2028

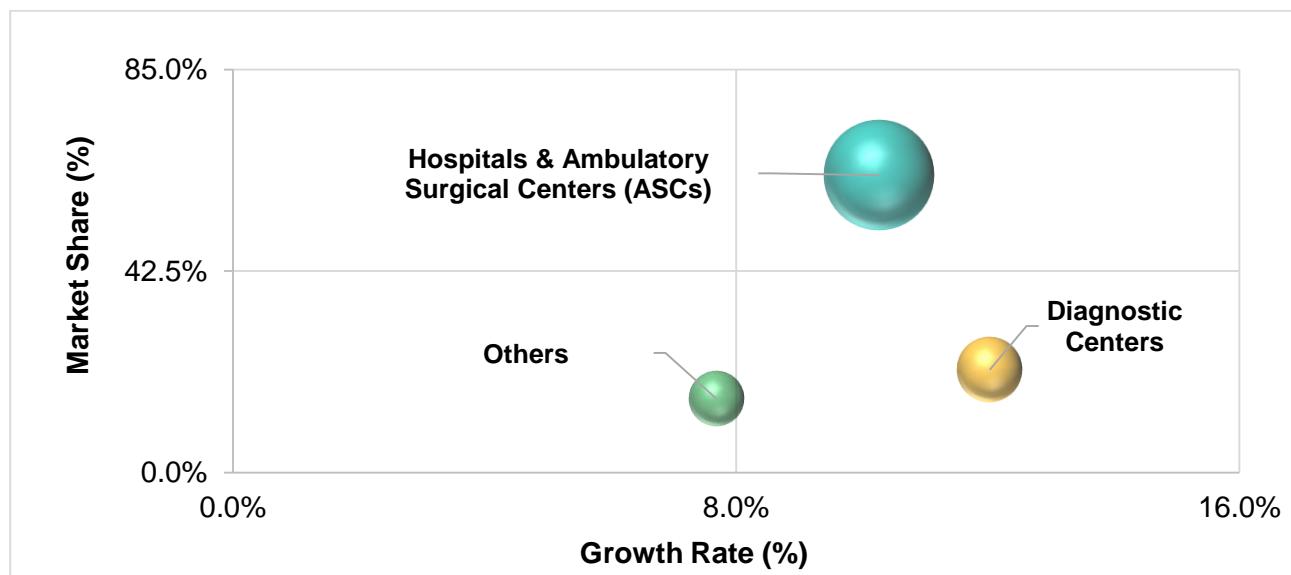


Source: BIS Research Analysis

The preceding figure depicts the Asia-Pacific portable imaging solutions market (by portable CT scanners), for 2017-2028. The portable CT scanners segment of the Asia-Pacific portable imaging solutions market was valued at \$28.6 million in 2017 and is anticipated to reach \$54.2 million by 2028, growing at a CAGR of 6.16% during the forecast period of 2018-2028. Asia-Pacific holds the third largest share in global portable CT scanners market, with 20.94% in 2017.

7.4.4 Asia-Pacific Portable Imaging Solutions Market (by End-Users) (Market Attractiveness Analysis)

Figure: 7.46 Asia-Pacific: Market Attractiveness Analysis (by End-Users) (2018-2028)



Source: BIS Research Analysis

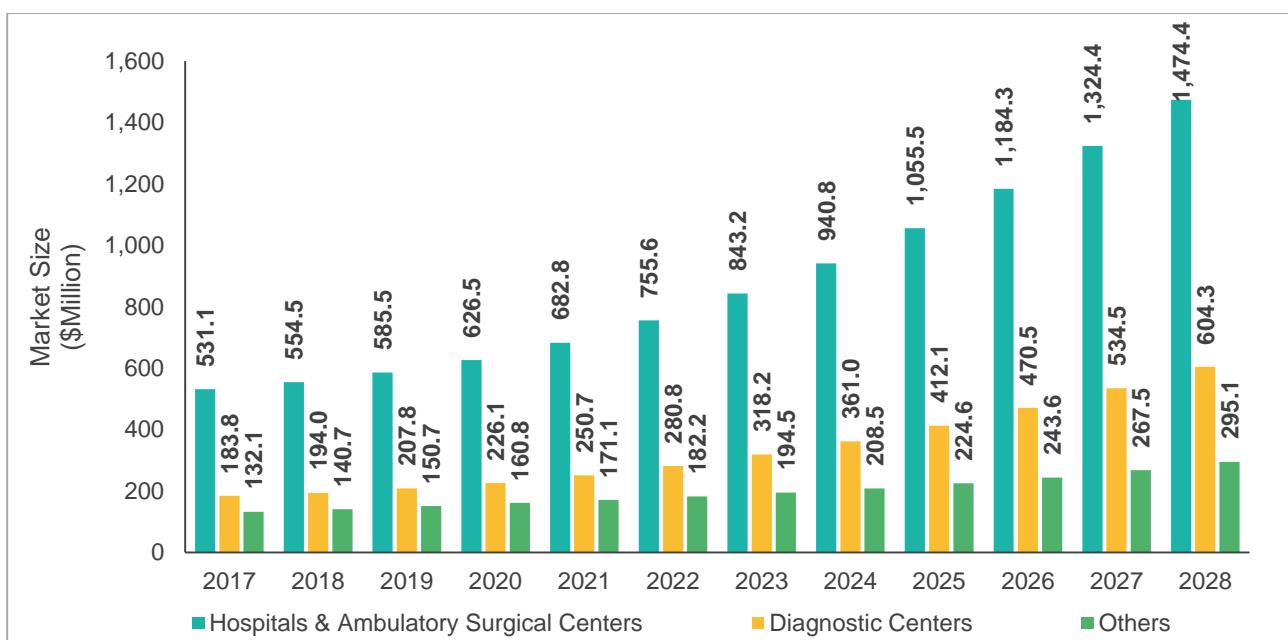
Hospitals and ambulatory surgical centers segment is the dominating end-user segment for Asia-Pacific portable imaging solutions market. As of 2017, this segment accounted for 62.70% share of the Asia-Pacific market size, turning in an estimated revenue of \$531.1 million. The market attractive analysis figure given above depicts the hospitals and ambulatory surgical centers segment to have a high market share and moderate growth rate. This segment is growing with a CAGR of 10.27% during the forecast period 2018-2028.

Diagnostic centers are the second-most dominating end-user segment for Asia-Pacific portable imaging solutions market. As of 2017, this segment accounted for 21.70% share of the Asia-Pacific market size, turning in an estimated revenue of \$183.8 million. This segment has become a fast-evolving segment in the Asia-Pacific portable imaging solutions market. The market attractiveness analysis figure given above depicts the segment to have a moderate market share and the fastest growth rate of 12.03% during the forecast period 2018-2028.

As of 2017, others end-user segment accounted for 15.60% share of the Asia-Pacific market size, turning in an estimated revenue of \$132.1 million. The market attractiveness analysis figure given above depicts this segment to have a low-moderate market share and growth rate. These estimations indicate that the market in others end-user segment will sustain the growth of CAGR of 7.68% during the forecast period 2018-2028.

7.4.5 Asia-Pacific Portable Imaging Solutions Market (by End-User)

Figure: 7.47 Asia-Pacific Portable Imaging Solutions Market (by End-User), 2017-2028



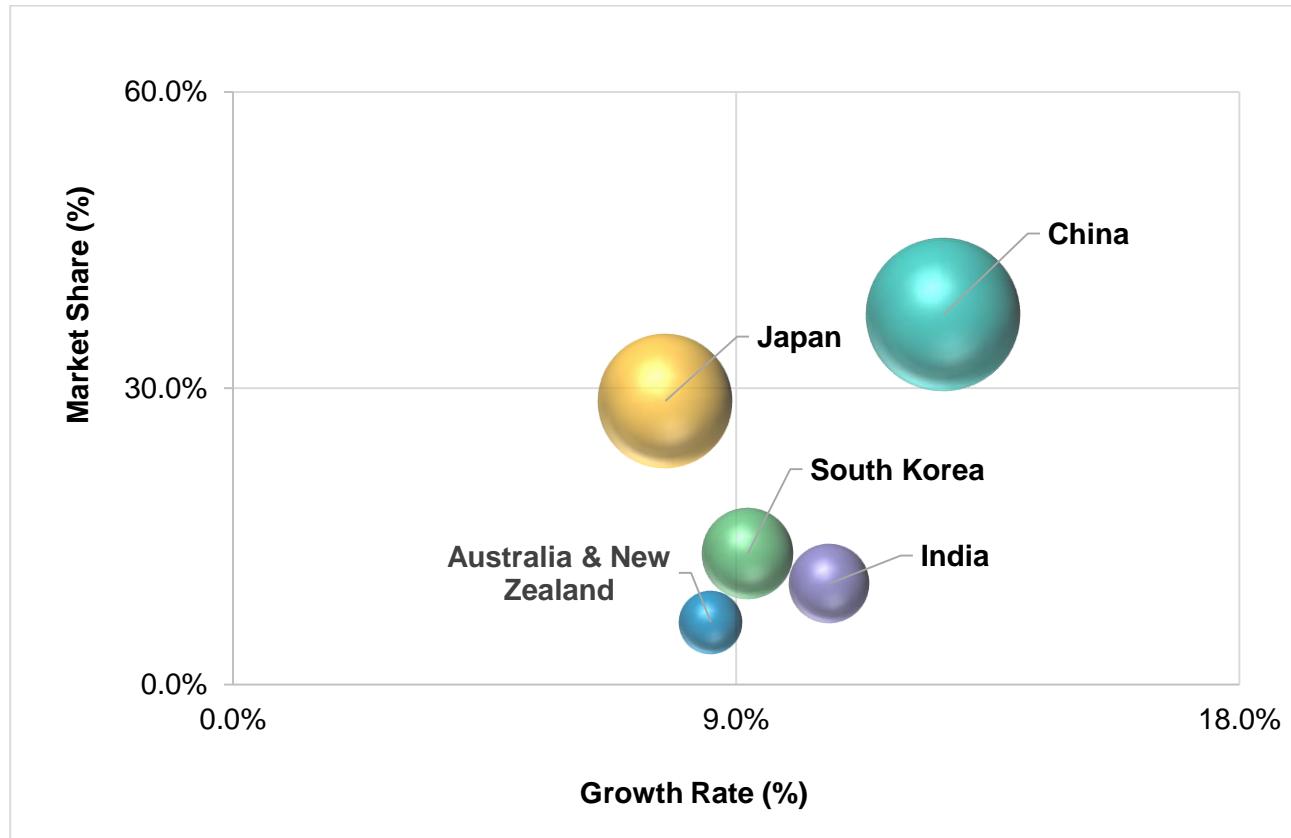
Source: BIS Research Analysis

The preceding figure depicts the Asia-Pacific portable imaging solutions market (by end-user), for 2017-2028. As of 2017, the Asia-Pacific portable imaging solutions market by end-user was dominated by hospitals and ambulatory surgical centers. This segment attributed to 62.70% of the total Asia-Pacific portable imaging solutions market (by end-user) in 2017. Also, hospitals and ambulatory surgical centers segment is anticipated to be the moderate growing segment with CAGR of 10.27% from 2018-2028.

In addition to that, diagnostic centers segment was valued at \$183.8 million in 2017 and is estimated to grow to \$604.3 million in 2028 with a CAGR of 12.03% from 2018-2028, whereas, others end-user segment was valued at \$132.1 million in 2017 and is anticipated to reach \$295.1 million in 2028 with a CAGR of 7.68% from 2018-2028.

7.4.6 Asia-Pacific Portable Imaging Solutions Market (by Country) (Market Attractiveness Analysis)

Figure: 7.48 Asia-Pacific: Market Attractiveness Analysis (by Country) (2018-2028)



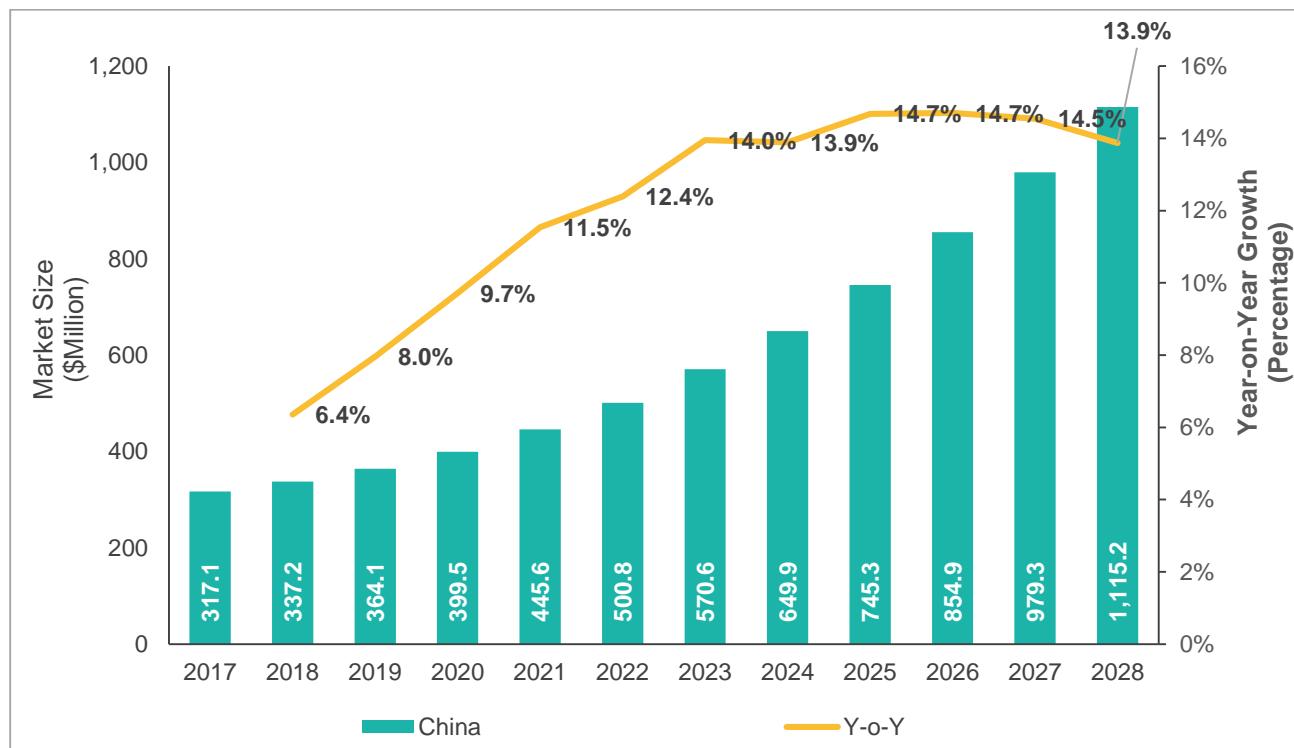
Source: BIS Research Analysis

The market attractiveness analysis for Asia-Pacific portable imaging solutions market has been done for the major contributing countries in the Asia-Pacific, namely China, India, Japan, South Korea, and Australia & New Zealand, among others.

The Asia-Pacific region is the largest market for portable imaging solutions, accounted for 34.80% share as of 2017. Globally, China is anticipated to be the fastest growing market for portable imaging solutions, growing at a CAGR of 12.70% during the forecast period 2018-2028. The exponential growth of this market is being driven by increasing geriatric populations and rising prevalence rate of chronic disorders.

7.4.6.1 China

Figure: 7.49 China Portable Imaging Solutions Market, 2017-2028



Source: BIS Research Analysis

The preceding figure depicts the China portable imaging solutions market, for 2017-2028. The China portable imaging solutions market was valued at \$317.1 million in 2017 and is anticipated to reach at \$1,115.2 million by 2028, growing at a CAGR of 12.70% during the forecast period 2018-2028. Contrast to the other Asia-Pacific countries, which are contributing significantly to the Asia-Pacific portable imaging solutions market, the market for portable imaging solutions in China is anticipated to hold the largest market share of 37.43% in 2017.

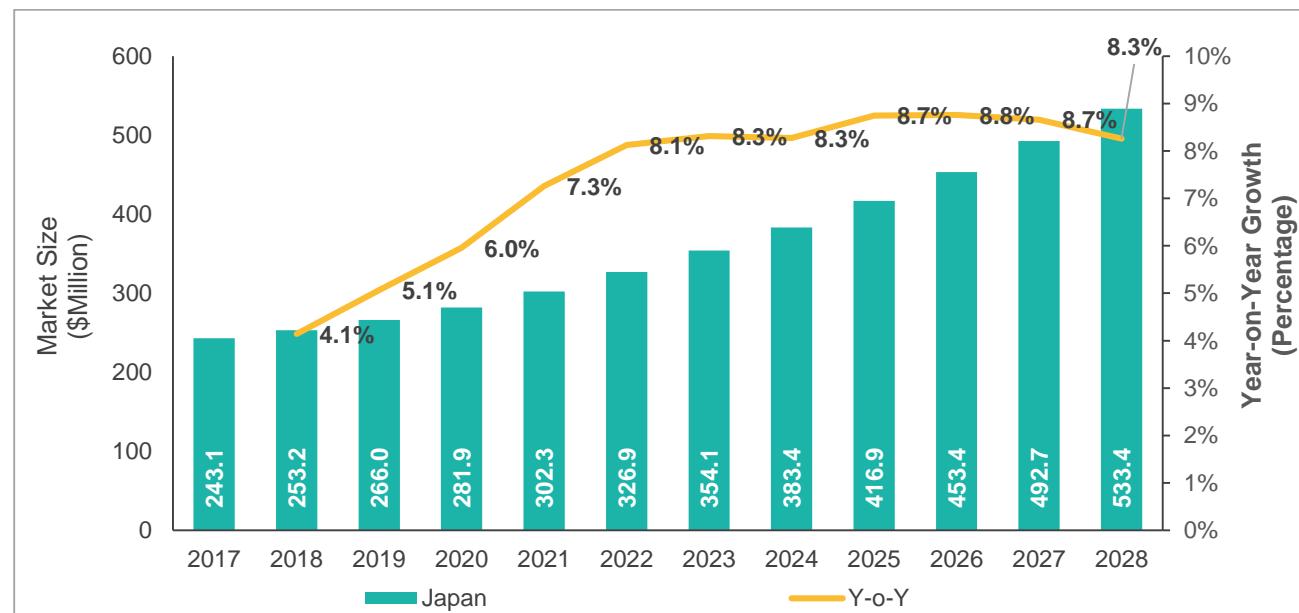
China is one of the countries with a massive potential for profitable expansion by key players of the global portable imaging solutions market. Large population base with few positive regulatory developments and improving healthcare facilities would make China a seamless destination for phenomenal profits. Many of the domestic players such as Konica Minolta, Inc., and Hitachi, Ltd., among others, have their operations in China, making it a major technological hub for scientific developments and innovation.

Table: 7.12 Macro-Economic Factors Driving the Market Growth of Portable Imaging Solutions in China (2016-2022)

Factors	2016	2017	2018	2019	2020	2021	2022
Population (\$Million)	1,378.67	1,384.96	1,391.77	1,398.57	1,405.38	1,412.19	1,419.00
GDP (\$Billion)	11,199.15	11,927.87	12,463.67	12,999.48	13,535.28	14,071.09	14,840.89
Health Insurance Coverage (%)	93.54	94.09	94.63	95.17	95.71	96.26	96.80
Number of Doctors/10,000 Population	36.79	37.32	37.86	38.39	38.93	39.46	40.00
Total Healthcare Market (\$Billion)	609.48	664.20	709.78	756.71	805.00	854.64	920.14
Total Medical Devices Market (\$Billion)	53.62	58.07	62.89	68.11	73.76	79.89	86.52

Source: BIS Research Analysis

7.4.6.2 Japan

Figure: 7.50 Japan Portable Imaging Solutions Market, 2017-2028


Source: BIS Research Analysis

The preceding figure depicts Japan portable imaging solutions market, for 2017-2028. The Japan portable imaging solutions market was valued at \$243.1 million in 2017 and is anticipated to reach at \$533.4 million by 2028, growing at a CAGR of 7.74% during the forecast period 2018-2028.

Japan has been one of the leading countries when it comes to the adoption of technologically advanced products owing to its refined healthcare infrastructure. Because of the presence of several healthcare companies and universities, Japan has been a technological hub for research and development. The Japanese government has also been supportive of implementing advanced technologies in the healthcare sector, including it as a part of its economic growth strategy and urging the companies to invest in the technology.

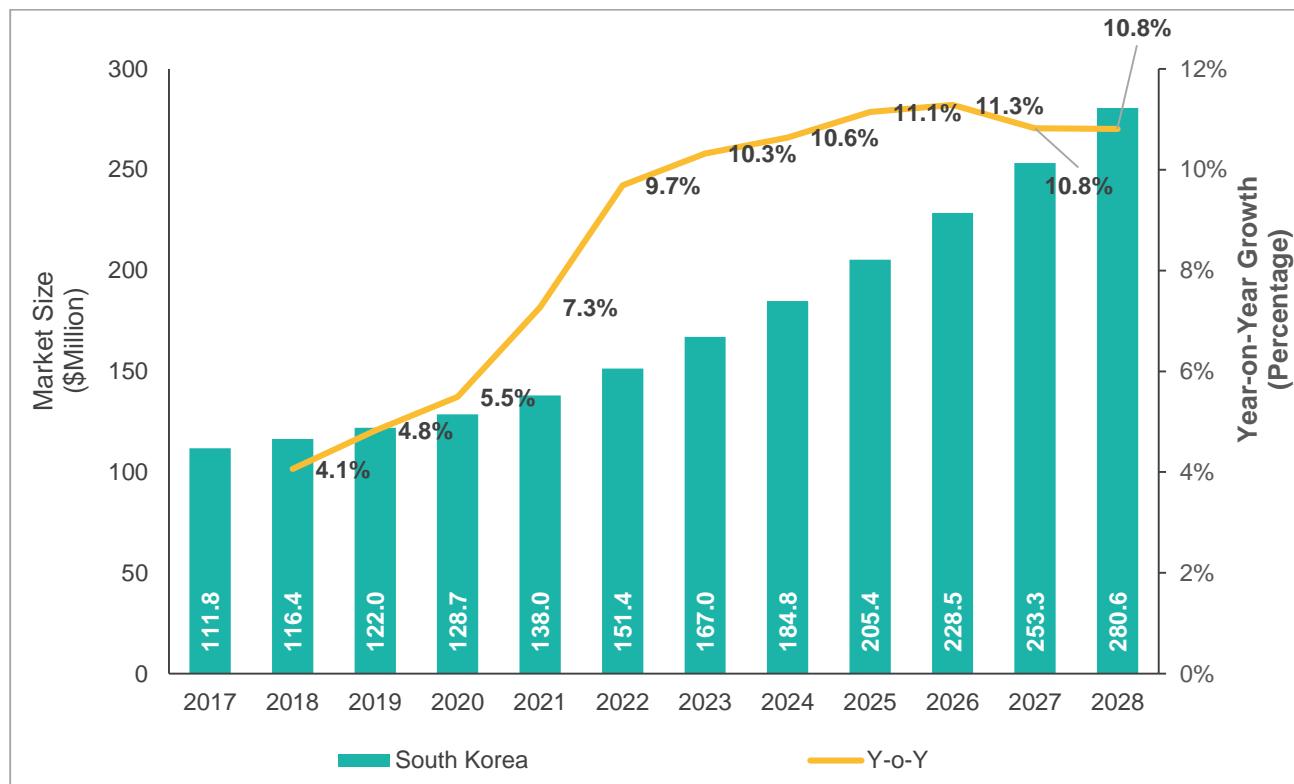
Table: 7.13 Macro-Economic Factors Driving the Market Growth of Portable Imaging Solutions in Japan (2016-2022)

Factors	2016	2017	2018	2019	2020	2021	2022
Population (\$Million)	126.99	126.42	125.84	125.26	124.68	124.11	123.53
GDP (\$Billion)	4,872.27	4,930.74	4,989.91	5,049.79	5,110.39	5,171.71	5,233.77
Health Insurance Coverage (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Number of Doctors/10,000 Population	23.76	23.80	23.78	23.75	23.73	23.70	23.68
Total Healthcare Market (\$Billion)	529.61	534.57	539.57	544.62	549.70	554.84	560.01
Total Medical Devices Market (\$Billion)	28.40	29.56	30.78	32.04	33.35	34.72	36.14

Source: BIS Research.

7.4.6.3 South Korea

Figure: 7.51 South Korea Portable Imaging Solutions Market, 2017-2028



Source: BIS Research Analysis

The preceding figure depicts South Korea portable imaging solutions market, for 2017-2028. South Korea is the third largest market of portable imaging solutions in Asia-Pacific. The market for portable imaging solutions in South Korea is anticipated to grow at a CAGR of 9.20% in the forecast period 2018-2028. In 2017, the market for portable imaging solutions in South Korea was valued to be \$111.8 million and is anticipated to reach \$280.6 million by 2028.

The growing awareness about benefits associated with the use of advanced technologies coupled with the rising demand of high quality of care among the patients are the leading factors propelling the growth of the market for portable imaging solutions in South Korea.

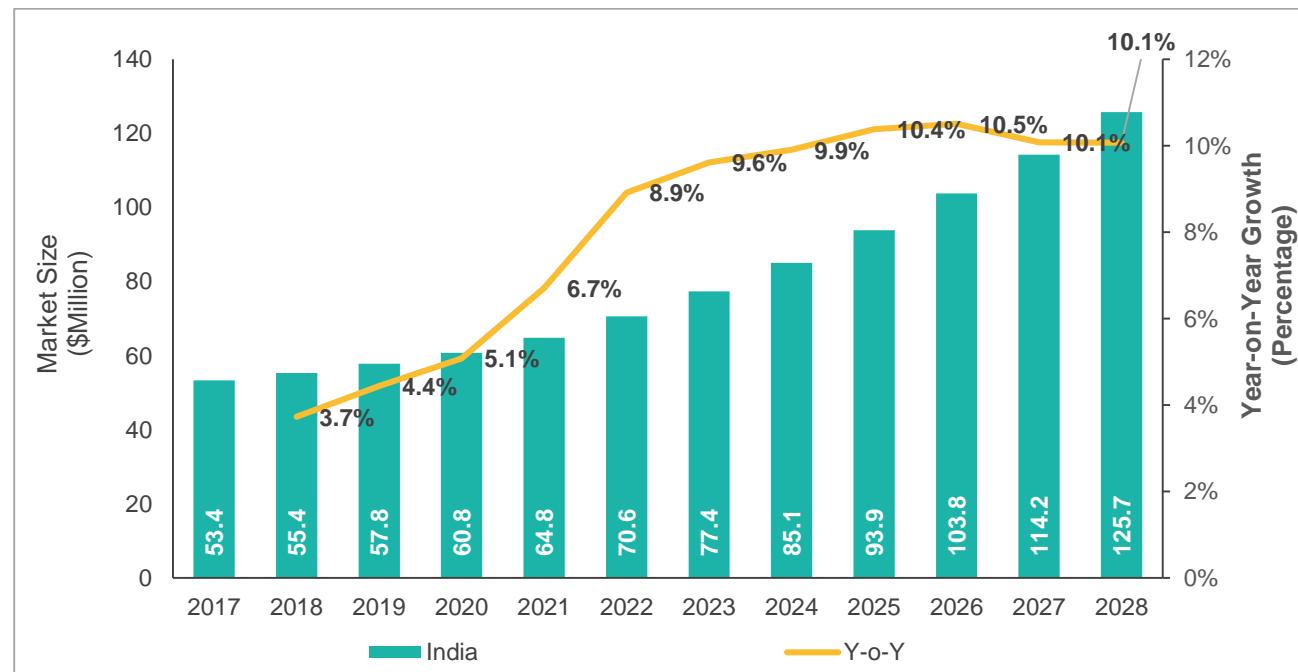
Table: 7.14 Macro-Economic Factors Driving the Market Growth of Portable Imaging Solutions in South Korea (2016-2022)

Factors	2016	2017	2018	2019	2020	2021	2022
Population (\$Million)	51.25	51.56	51.84	52.11	52.39	52.67	52.95
GDP (\$Billion)	1,411.25	1,538.00	1,641.40	1,744.80	1,848.20	1,951.60	2,055.00
Health Insurance Coverage (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Number of Doctors/10,000 Population	23.26	23.58	23.91	24.23	24.55	24.88	25.20
Total Healthcare Market (\$Billion)	104.52	114.15	122.08	130.04	138.04	146.06	154.13
Total Medical Devices Market (\$Billion)	5.09	5.38	5.69	6.01	6.35	6.72	7.10

Source: BIS Research Analysis

7.4.6.4 India

Figure: 7.52 India Portable Imaging Solutions Market, 2017-2028



Source: BIS Research Analysis

The preceding figure depicts India portable imaging solutions market, for 2017-2028. India is the fourth largest contributor to the Asia-Pacific portable imaging solutions market. In 2017, the market for portable imaging solutions in India was valued to be \$53.4 million and is anticipated to reach \$125.7 million by 2028, registering a CAGR of 10.66% in the forecast period 2018-2028.

The adoption of portable imaging technologies in the healthcare industry has started to pick up the pace in recent times. According to the government data, India is short by 0.5 million doctors as per the World Health Organization's norm. Lack of basic infrastructure leading to rising health concerns is another factor that has acted as a driver for the portable imaging solutions in the healthcare market.

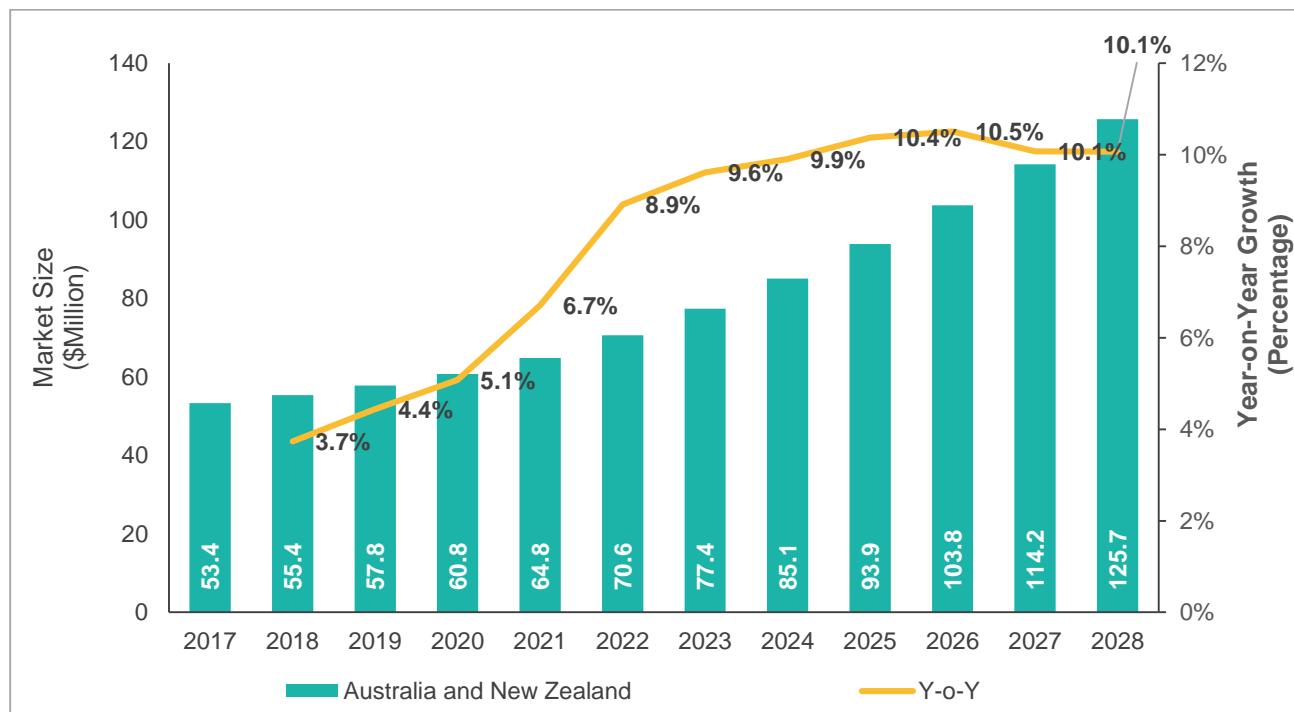
Table: 7.15 Macro-Economic Factors Driving the Market Growth of Portable Imaging Solutions in India (2016-2022)

Factors	2016	2017	2018	2019	2020	2021	2022
Population (\$Million)	1,326.00	1,342.00	1,357.80	1,373.60	1,389.40	1,405.10	1,420.80
GDP (\$Billion)	2,471.30	2,631.90	2,803.00	2,985.20	3,179.20	3,385.90	3,606.00
Health Insurance Coverage (%)	19.70	20.00	20.30	21.50	21.80	22.10	22.30
Number of Doctors/10,000 Population	7.90	7.94	7.99	8.03	8.07	8.11	8.16
Total Healthcare Market (\$Billion)	107.50	113.10	119.00	125.20	131.70	138.50	145.70
Total Medical Devices Market (\$Billion)	5.60	6.03	6.50	7.00	7.53	8.11	8.74

Source: BIS Research Analysis

7.4.6.5 Australia and New Zealand

Figure: 7.53 Australia and New Zealand Portable Imaging Solutions Market, 2017-2028



Source: BIS Research Analysis

The preceding figure depicts Australia and New Zealand portable imaging solutions market, for 2017-2028. The Australia and New Zealand is the fifth largest contributor to the Asia-Pacific portable imaging solutions market. In 2017, the market for portable imaging solutions in Australia and New Zealand was valued to be \$53.4 million and is anticipated to reach \$125.7 million by 2028, registering a CAGR of 8.55% in the forecast period 2018-2028.

Table: 7.16 Macro-Economic Factors Driving the Market Growth of Portable Imaging Solutions in Australia and New Zealand (2016-2022)

Factors	Country	2016	2017	2018	2019	2020	2021	2022
Population (\$Million)	Australia	24.21	24.41	24.62	24.82	25.03	25.23	25.44
	New Zealand	4.69	4.71	4.76	4.82	4.87	4.93	4.98
GDP (\$Billion)	Australia	1,264.50	1,379.50	1,474.00	1,568.50	1,663.00	1,757.50	1,852.00



BIS Research

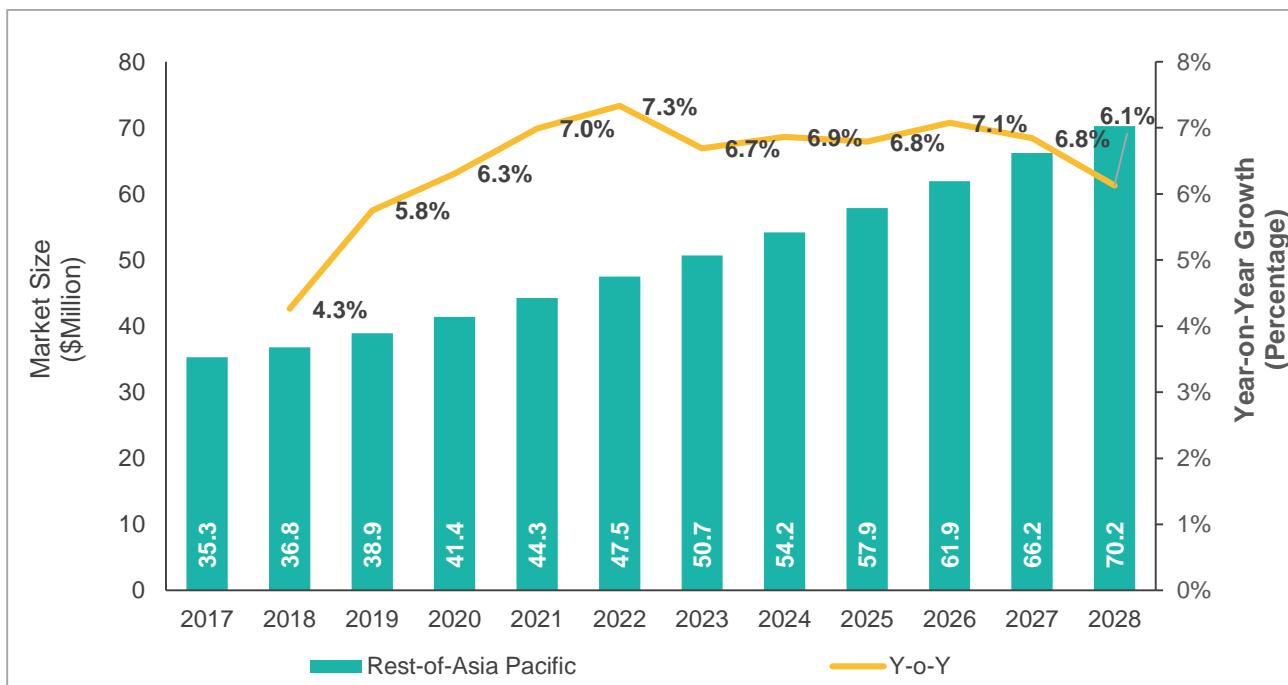
Global Portable Imaging Solutions Market

	New Zealand	184.97	201.00	217.60	234.20	250.80	267.40	284.00
Health Insurance Coverage (%)	Australia	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	New Zealand	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Number of Doctors/10,000 Population	Australia	35.48	35.72	35.96	36.20	36.44	36.68	36.92
	New Zealand	30.68	30.75	30.82	30.89	30.96	31.03	31.10
Total Healthcare Market (\$Billion)	Australia	120.08	131.70	141.46	151.33	161.29	171.34	181.50
	New Zealand	17.29	18.81	20.38	21.95	23.53	25.11	26.70
Total Medical Devices Market (\$Billion)	Australia	6.40	6.68	6.98	7.28	7.60	7.94	8.29
	New Zealand	0.74	0.82	0.89	0.97	1.05	1.12	1.20

Source: BIS Research.

7.4.6.6 Rest-of-Asia-Pacific

Figure: 7.54 Rest-of-Asia-Pacific Portable Imaging Solutions Market, 2017-2028



Source: BIS Research Analysis

The preceding figure depicts Rest-of-Asia-Pacific portable imaging solutions market, for 2017-2028. The Rest-of-Asia-Pacific constitutes several emerging economies such as Malaysia, Singapore, Indonesia, Thailand, and Taiwan, among others. The market for portable imaging solutions in Rest-of-Asia-Pacific is anticipated to grow at a CAGR of 6.68% in the forecast period 2018-2028. In 2017, the market for portable imaging solutions in Rest-of-Asia-Pacific was valued to be \$35.3 million and is anticipated to reach \$70.2 million by 2028.

Factors such as growing elderly population, rising prevalence of chronic disorders, and the emergence of technologically advanced products, has significantly improved the adoption of portable imaging solutions in Rest-of-Asia-Pacific region.

7.5 Latin America Portable Imaging Solutions Market

7.5.1 Market Snapshot

Latin America has been in dire need for technological changes to improve its healthcare system and economic growth. According to the estimates of the World Health Organization (WHO), approximately 700,000 individuals die because of the lack of access to medicines and proper treatment. According to the World Bank, the region invests only 0.8% of its total GDP on R&D activities whereas the average spending for all the regions is 2.4%. The annual GDP growth for Latin America has only been 3% since 2010, which is slower than any other developing region. These factors have been acting as the market drivers and have encouraged companies and organizations to adopt advanced technologies in the healthcare industry.

Figure: 7.55 Market Snapshot: Latin America Portable Imaging Solutions Market



Source: BIS Research Analysis

Note: Inner circle represents 2017 market size and outer circle represents 2028 market size

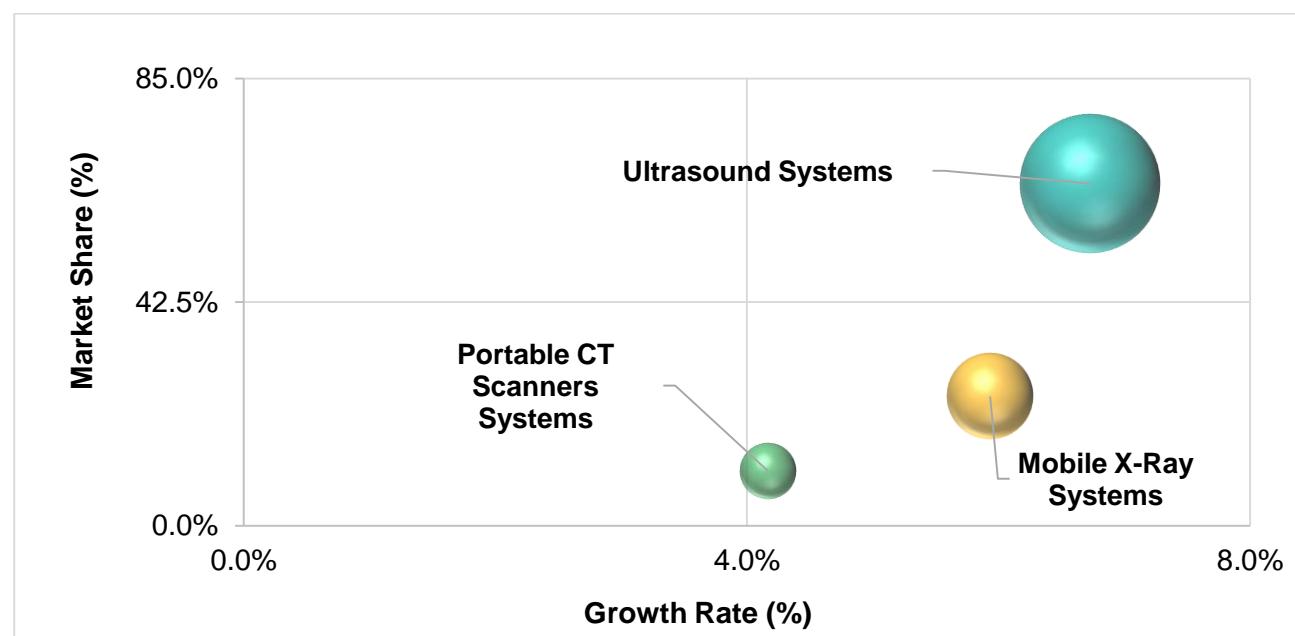
Table: 7.17 Macro-Economic Factors Driving the Market Growth of Portable Imaging Solutions in Latin America (2016-2022)

Factors	2016	2017	2018	2019	2020	2021	2022
Population (\$Million)	445.60	450.03	454.30	458.57	462.84	467.11	471.38
GDP (\$Billion)	3,918.08	4,427.00	4,669.20	4,911.40	5,153.60	5,395.80	5,638.00
Health Insurance Coverage (%)	72.94	73.59	74.23	74.87	75.51	76.16	76.80
Number of Doctors/10,000 Population	23.04	23.26	23.47	23.69	23.90	24.11	24.33
Total Healthcare Market (\$Billion)	297.12	337.69	357.07	376.56	396.17	415.88	435.72
Total Medical Devices Market (\$Billion)	13.24	14.83	16.53	18.32	20.20	22.22	24.34

Source: BIS Research Analysis

7.5.2 Latin America Portable Imaging Solutions Market (by Product Type) (Market Attractiveness Analysis)

Figure: 7.56 Latin America: Market Attractiveness Analysis (by Product Type) (2018-2028)



Source: BIS Research Analysis

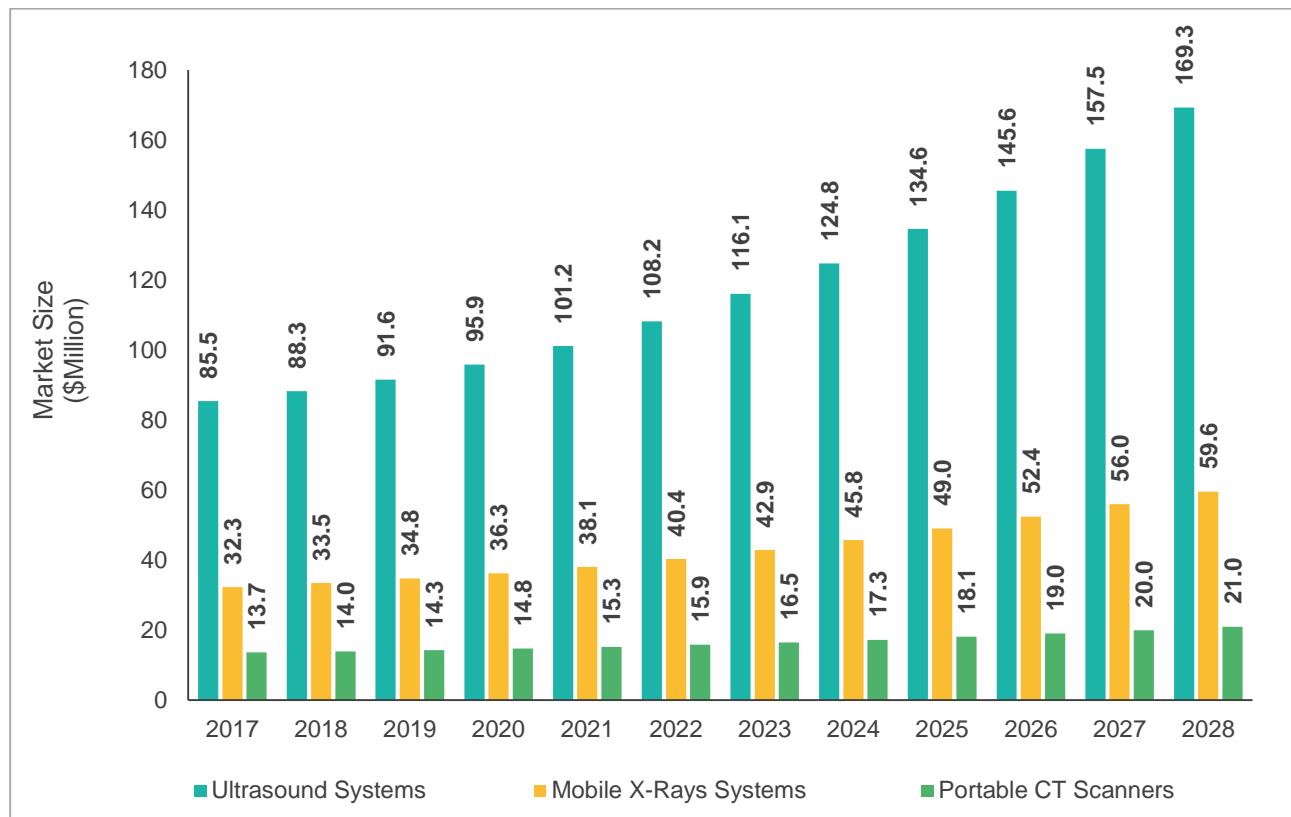
Ultrasound systems segment is the dominating product type segment for Latin America portable imaging solutions market. As of 2017, this segment accounted for 65.03% share of the Latin America market size, turning in an estimated revenue of \$85.5 million. The above market attractive analysis figure depicts the ultrasound systems segment to have a high market share and a high growth rate. These estimations indicate that the market for ultrasound systems is already replete with a huge number of products addressing the respective needs. This segment is growing at a CAGR of 6.73% during the forecast period 2018-2028.

Mobile X-ray systems are the second-most dominating product type segment for Latin America portable imaging solutions market. As of 2017, this segment accounted for 24.57% share of the Latin America market size, turning in an estimated revenue of \$32.3 million. This segment has become a fast-evolving segment in Latin America portable imaging solutions market. The market attractiveness analysis figure given above depicts this segment to have a moderate market share and growth-rate among all other product type segments. These estimations indicate that the market for mobile X-ray systems is rapidly evolving and will sustain the growth with a robust CAGR of 5.93% during the forecast period 2018-2028.

As of 2017, portable CT scanners product type segment accounted for 10.40% share of the Latin America market size, turning in an estimated revenue of \$13.7 million. The market attractiveness analysis figure depicts this segment to have a low-moderate market share and growth-rate among all other product type segments. These estimations indicate that the market for portable CT scanners will sustain the growth of CAGR of 4.17% during the forecast period 2018-2028.

7.5.3 Latin America Portable Imaging Solutions Market (by Product Type)

The Latin America portable imaging solutions market was valued at \$131.4 million in 2017 and is anticipated to reach \$249.9 million by 2028, growing at a CAGR of 6.30% during the forecast period of 2018-2028.

Figure: 7.57 Latin America Portable Imaging Solutions Market (by Product Type), 2017-2028


Source: BIS Research Analysis

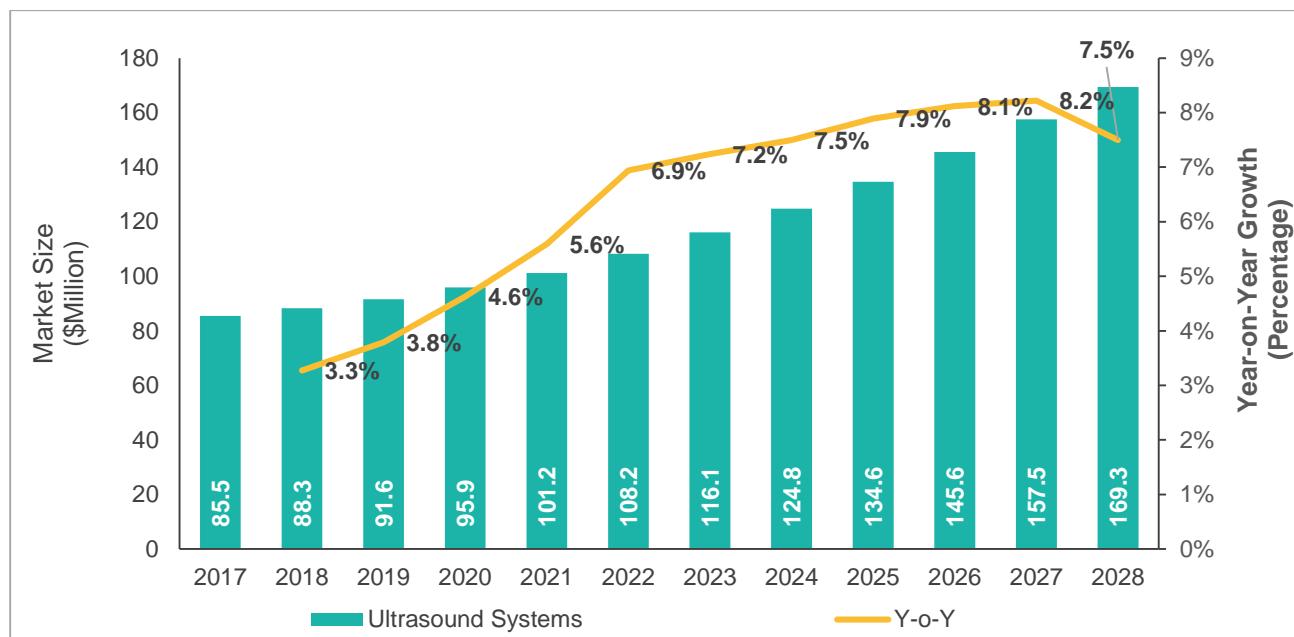
The preceding figure depicts the Latin America portable imaging solutions market (by product type), for 2017-2028. As of 2017, the Latin America portable imaging solutions market by product type was dominated by ultrasound systems. This segment attributed to 65.03% of the total Latin America portable imaging solutions market (by product type) in 2017. Also, ultrasound segment is anticipated to be the fastest growing segment with CAGR of 6.73% during the forecast period 2018-2028.

In addition to that, the mobile X-ray systems segment was valued at \$32.3 million in 2017 and is estimated to grow to \$59.6 million in 2028 with a CAGR of 5.93% from 2018-2028. Whereas, portable CT scanners segment was valued at \$13.7 million in 2017 and is anticipated to reach \$21.0 million in 2028 with a CAGR of 4.17% from 2018-2028.

The market in Latin America is expected to have a promising growth for this industry with increasing governmental initiatives in improving the healthcare infrastructures and established companies which are expanding their distribution business in such emerging markets. Latin America includes countries such as Mexico, Brazil, Argentina, and Colombia, among others.

7.5.3.1 Latin America Ultrasound Systems Market

Figure: 7.58 Latin America Portable Imaging Solutions Market (by Ultrasound Systems), 2017-2028

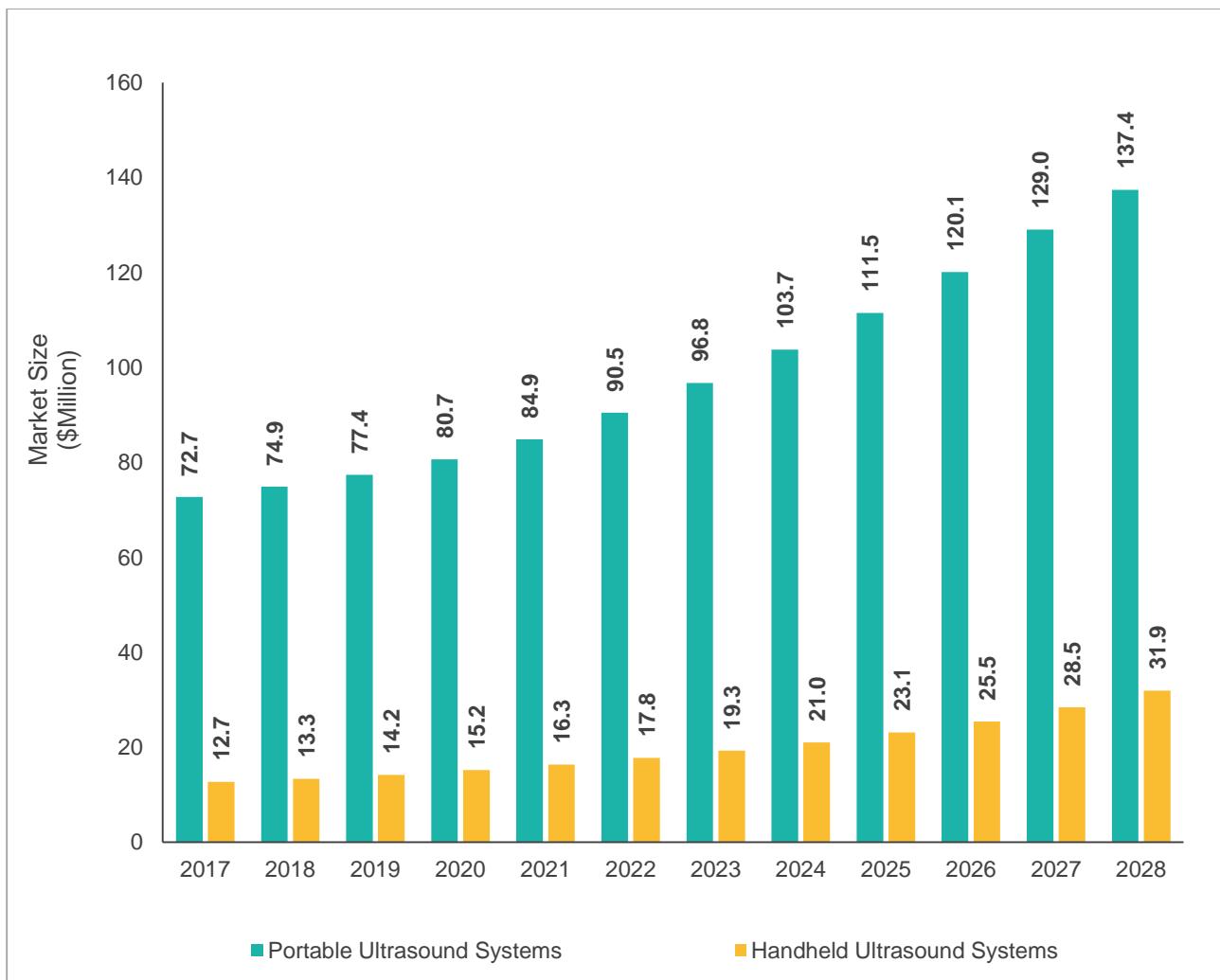


Source: BIS Research Analysis

The preceding figure depicts the Latin America portable imaging solutions market (by ultrasound systems), for 2017-2028. The ultrasound segment of the Latin America portable imaging solutions market was valued at \$85.5 million in 2017 and is anticipated to reach \$169.3 million by 2028, growing at a CAGR of 6.73% during the forecast period 2018-2028.

The ultrasound systems are the fastest growing segment in Latin America portable imaging solutions market. Several manufacturers are focused on increasing their market growth in the Latin America region. For example, in 2017, Koninklijke Philips N.V. took multiple growth initiatives in Latin America by providing advanced technologies to hospitals and clinics, and also expanded its manufacturing units in Varginha which produces ultrasound systems, tomography systems, and magnetic resonance systems. In Argentina, Koninklijke Philips N.V. introduced Mobile Mother and Child Care program, providing free obstetrical ultrasounds tests to women.

Figure: 7.59 Latin America Portable Imaging Solutions Market (by Portable Ultrasound Systems and Handheld Ultrasound Systems), 2017-2028



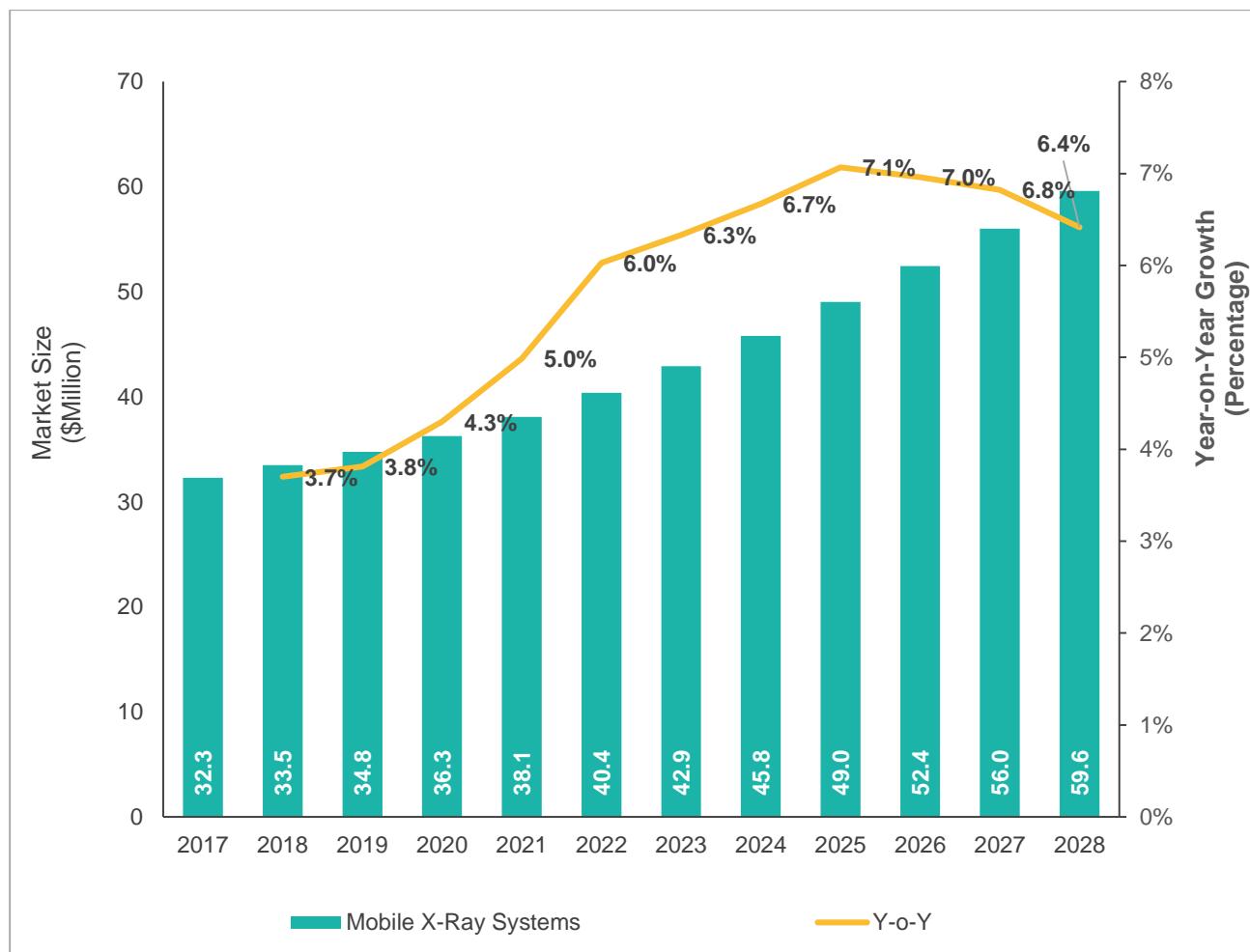
Source: BIS Research Analysis

The preceding figure depicts the Latin America portable imaging solutions market (by portable ultrasound systems and handheld ultrasound systems), for 2017-2028. The Latin America portable ultrasound systems market was estimated to have a value of \$72.7 million, in 2017. The market is expected to grow at a CAGR of 6.25% during the forecast period 2018-2028 and attain a value of \$137.4 million by 2028.

Whereas, handheld ultrasound systems market is anticipated to grow at the fastest rate within the Latin America ultrasound systems market attaining a CAGR of 9.11% during the forecast period 2018-2028.

7.5.3.2 Latin America Mobile X-Ray Systems Market

Figure: 7.60 Latin America Portable Imaging Solutions Market (by Mobile X-Ray Systems), 2017-2028

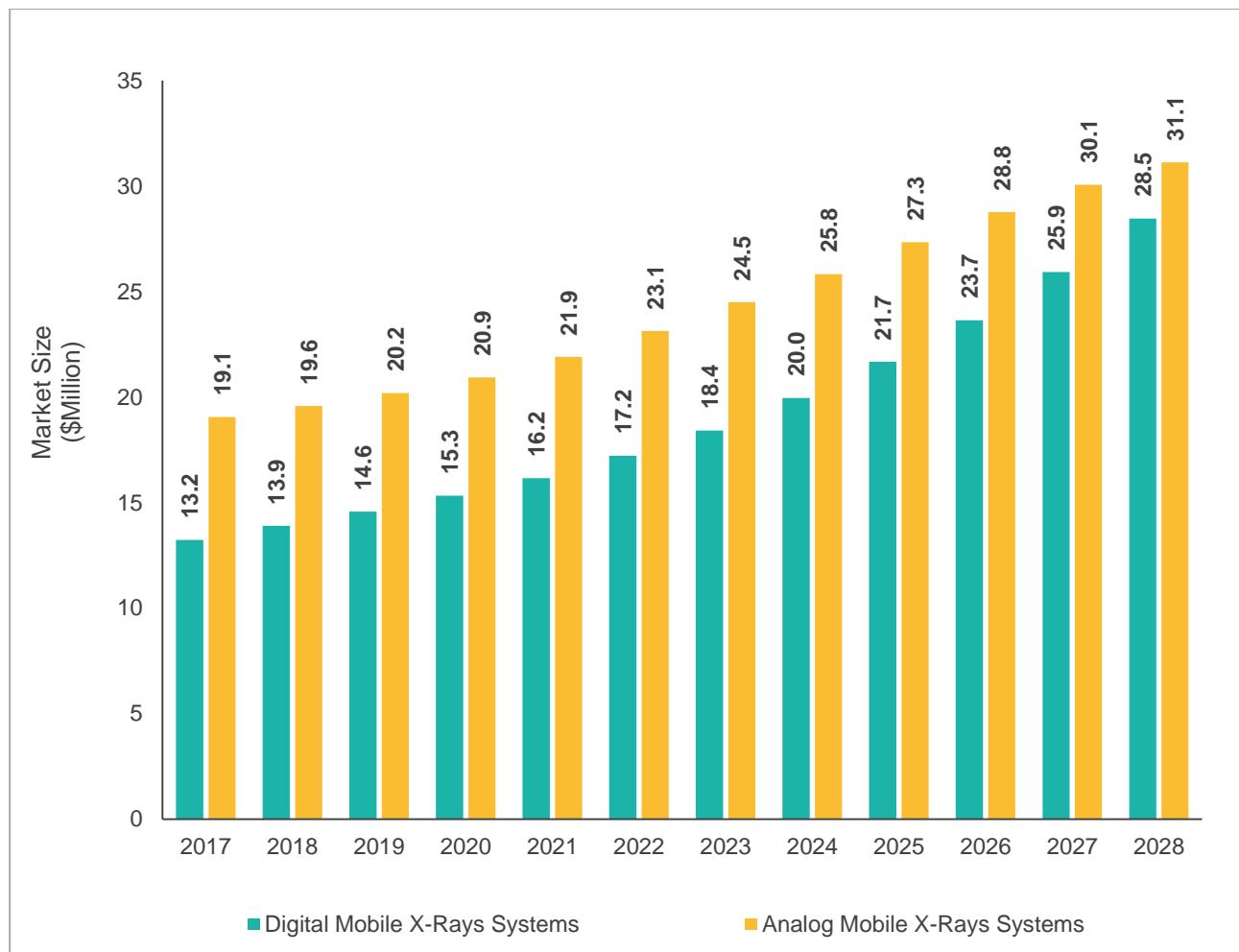


Source: BIS Research Analysis

The preceding figure depicts the Latin America portable imaging solutions market (by mobile X-ray systems), for 2017-2028. The mobile X-ray systems segment of the Latin America portable imaging solutions market was valued at \$32.3 million in 2017 and is anticipated to reach \$59.6 million by 2028, growing at a CAGR of 5.93% during the forecast period of 2018-2028.

The factors such as increasing demand for portable solutions and need for care outside conventional healthcare facilities are driving the growth of Latin America mobile X-ray systems market. A shift towards urbanization, rising geriatric population, and increasing chronic conditions have accelerated the adoption of advanced technologies in the healthcare facilities.

Figure: 7.61 Latin America Portable Imaging Solutions Market (by Analog Mobile X-Ray and Digital Mobile X-Ray Systems), 2017-2028



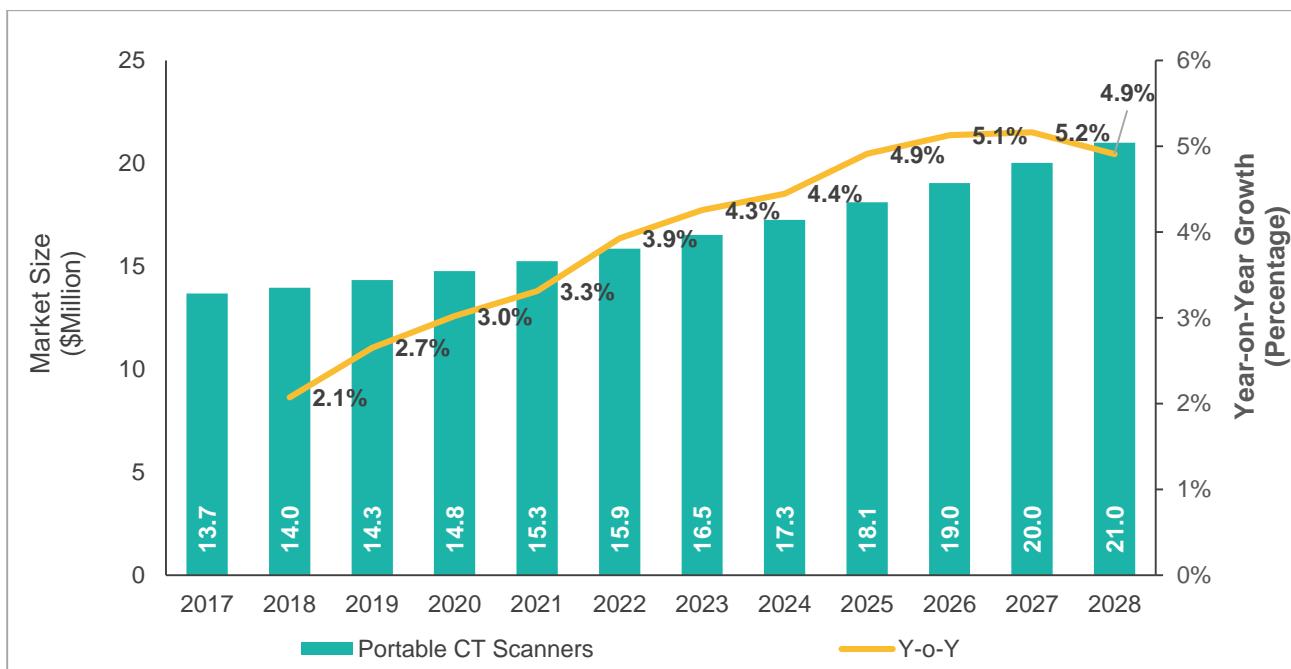
Source: BIS Research Analysis

The preceding figure depicts the Latin America portable imaging solutions market (by analog mobile X-ray systems and digital mobile X-ray systems), for 2017-2028. The analog mobile X-ray systems market was estimated to have a value of \$19.1 million, in 2017. The market is expected to grow at a CAGR of 4.74% during the forecast period 2018-2028 and attain a value of \$31.1 million by 2028.

Whereas, the digital mobile X-ray systems market is anticipated to grow at the fastest rate within the Latin America mobile X-ray systems market attaining a CAGR of 7.43% during the forecast period 2018-2028.

7.5.3.3 Latin America Portable CT Scanners Market

Figure: 7.62 Latin America Portable Imaging Solutions Market (by Portable CT Scanners), 2017-2028

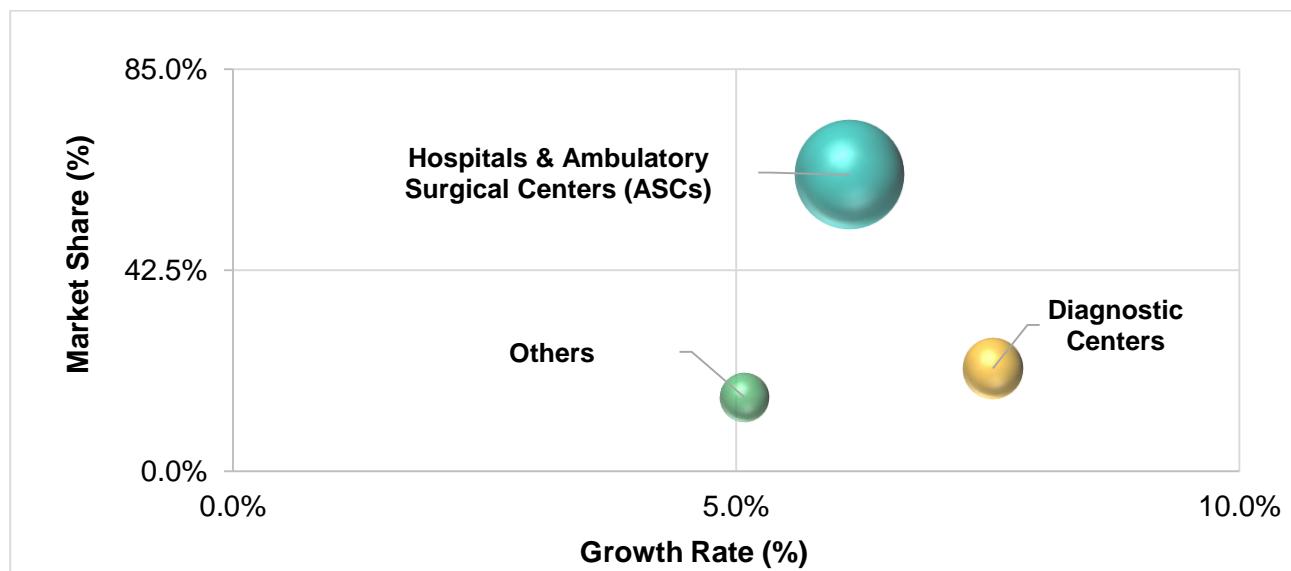


Source: BIS Research Analysis

The preceding figure depicts the Latin America portable imaging solutions market (by portable CT scanners), for 2017-2028. The portable CT scanners segment of the Latin America portable imaging solutions market was valued at \$13.7 million in 2017 and is anticipated to reach \$21.0 million by 2028, growing at a CAGR of 4.17% during the forecast period of 2018-2028. Latin America holds the fourth largest share in global portable CT scanners market, with 10.03% in 2017.

7.5.4 Latin America Portable Imaging Solutions Market (by End-Users) (Market Attractiveness Analysis)

Figure: 7.63 Latin America: Market Attractiveness Analysis (by End-Users) (2018-2028)



Source: BIS Research Analysis

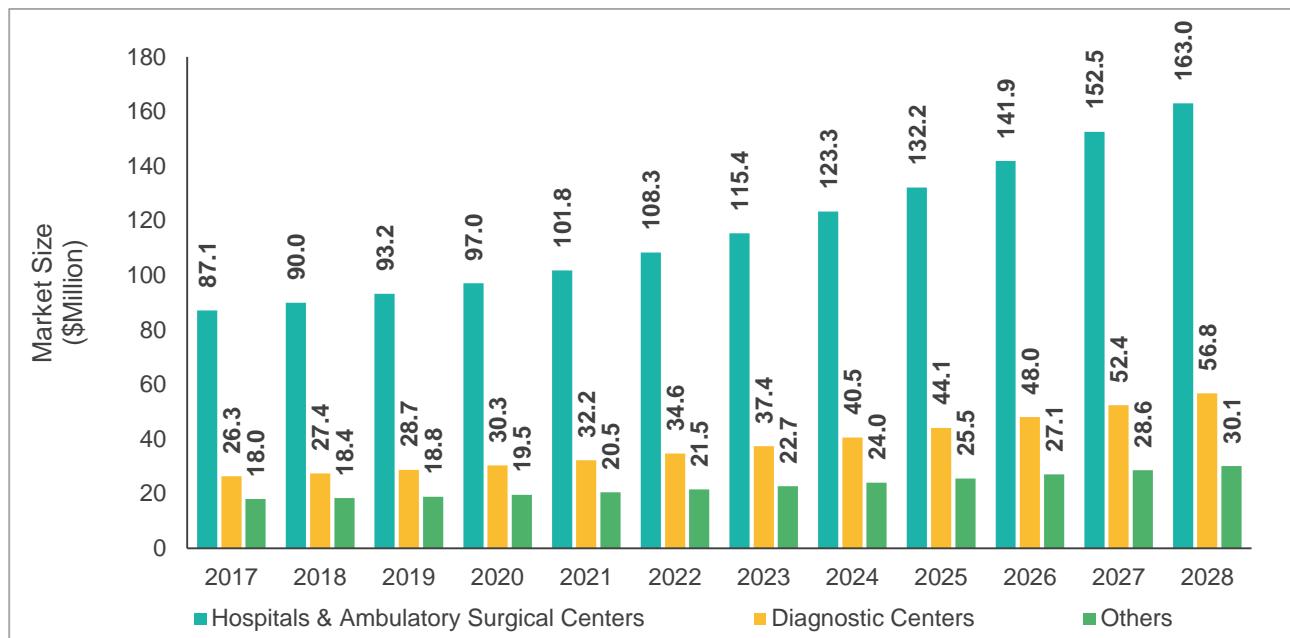
Hospitals and ambulatory surgical centers segment is the dominating end-user segment for Latin America portable imaging solutions market. As of 2017, this segment accounted for 66.30% share of the Latin America market size, turning in an estimated revenue of \$87.1 million. The above market attractive analysis figure depicts the hospitals and ambulatory surgical centers segment to have a high market share and moderate growth rate. This segment is growing with a CAGR of 6.13% during the forecast period 2018-2028.

Diagnostic centers are the second-most dominating end-user segment for Latin America portable imaging solutions market. As of 2017, this segment accounted for 20.00% share of the Latin America market size, turning in an estimated revenue of \$26.3 million. This segment has become a fast-evolving segment in Latin America portable imaging solutions market. The market attractiveness analysis figure above depicts the segment to have a moderate market share and the fastest growth rate of 7.55% during the forecast period 2018-2028.

As of 2017, others end-user segment accounted for 13.70% share of the Latin America market size, turning in an estimated revenue of \$18.0 million. The market attractiveness analysis figure given above depicts this segment to have a low-moderate market share and growth rate. These estimations indicate that the market in others end-user segment will sustain the growth of CAGR of 5.09% during the forecast period 2018-2028.

7.5.5 Latin America Portable Imaging Solutions Market (by End-User)

Figure: 7.64 Latin America Portable Imaging Solutions Market (by End-User), 2017-2028



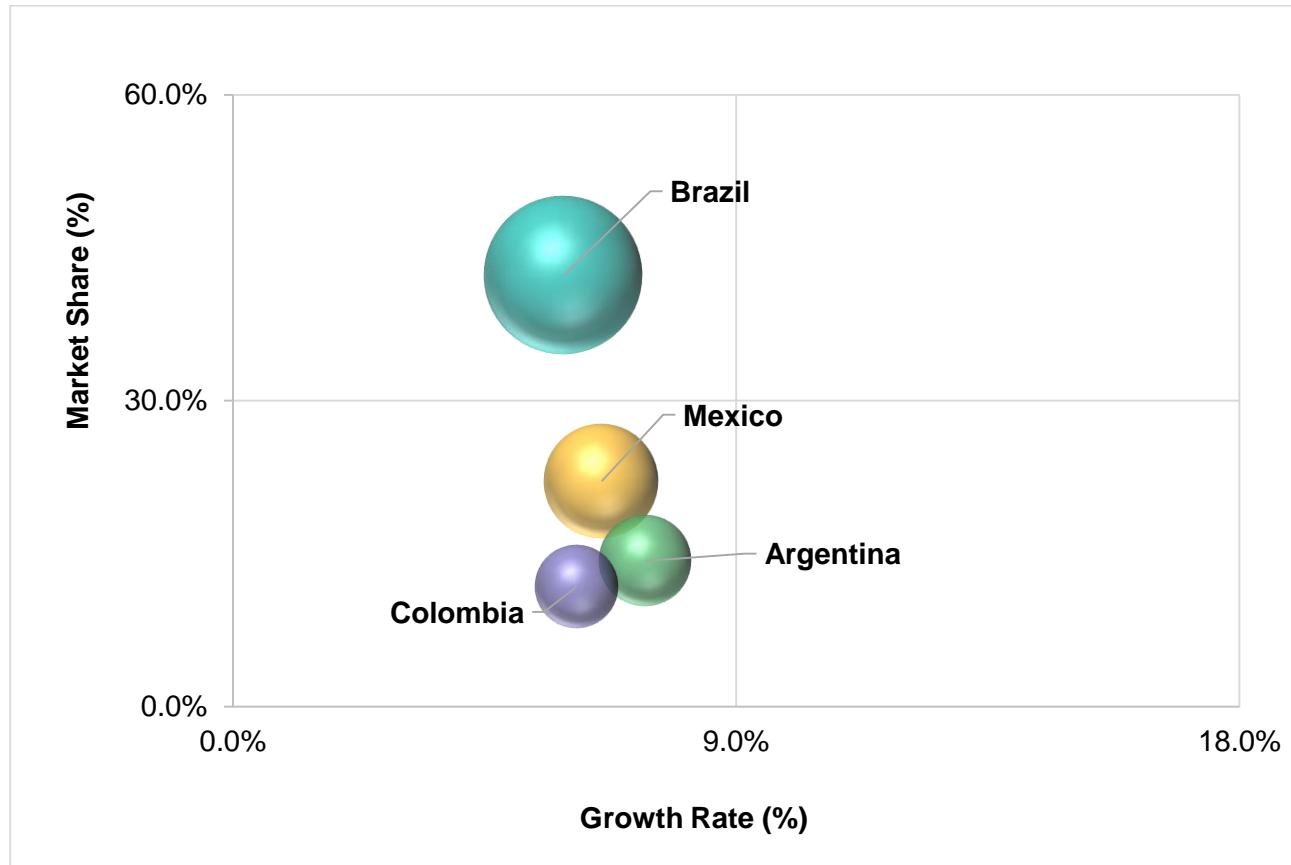
Source: BIS Research Analysis

The preceding figure depicts the Latin America portable imaging solutions market (by end-user), for 2017-2028. As of 2017, the Latin America portable imaging solutions market by end-users was dominated by hospitals and ambulatory surgical centers. This segment attributed to 66.30% of the total Latin America portable imaging solutions market (by end-users) in 2017. Also, hospitals and ambulatory surgical centers segment is anticipated to be the moderate growing segment with CAGR of 6.13% from 2018-2028.

In addition to that, diagnostic centers segment was valued at \$26.3 million in 2017 and is estimated to grow to \$56.8 million in 2028 with a CAGR of 7.55% from 2018-2028, whereas, others end-user segment was valued at \$18.0 million in 2017 and is anticipated to reach \$30.1 million in 2028 with a CAGR of 5.09% from 2018-2028.

7.5.6 Latin America Portable Imaging Solutions Market (by Country) (Market Attractiveness Analysis)

Figure: 7.65 Latin America: Market Attractiveness Analysis (by Country) (2018-2028)



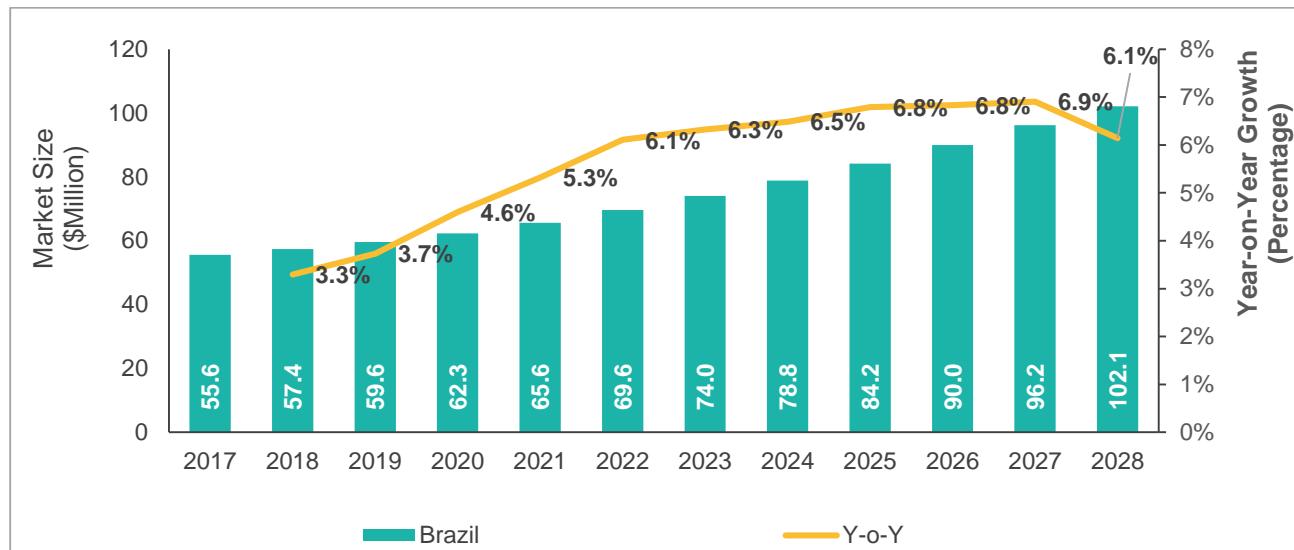
Source: BIS Research Analysis

The market attractiveness analysis for Latin America portable imaging solutions market has been done for the major contributing countries in the Asia-Pacific, namely Brazil, Mexico, Colombia, and Argentina, among others.

The Latin America region is the fourth largest market for portable imaging solutions, accounted for a 5.40% share as of 2017. In the Latin America region, Argentina is anticipated to be the fastest growing market for portable imaging solutions, growing at a CAGR of 7.38% during the forecast period 2018-2028. The exponential growth of this market is being driven by the rising prevalence rate of chronic disorders and increasing demand for portable imaging solutions of point-of-care applications.

7.5.6.1 Brazil

Figure: 7.66 Brazil Portable Imaging Solutions Market, 2017-2028



Source: BIS Research Analysis

The preceding figure depicts the Brazil portable imaging solutions market, for 2017-2028. The Brazil portable imaging solutions market was valued at \$55.6 million in 2017 and is anticipated to reach \$102.1 million by 2028, growing at a CAGR of 5.92% during the forecast period 2018-2028.

Brazil possesses one of the fastest emerging economies on the global level. The country holds the largest economy in the Latin American region and a significant potential for expansion by key players of the global portable imaging solutions market. Several conglomerate companies such as General Electric Company, Koninklijke Philips N.V., and Siemens Healthineers, Inc., among others, are making strenuous efforts and substantial investments in marketing strategies to promote the use of portable imaging modalities.

Table: 7.18 Macro-Economic Factors Driving the Market Growth of Portable Imaging Solutions in Brazil (2016-2022)

Factors	2016	2017	2018	2019	2020	2021	2022
Population (\$Million)	207.65	209.58	211.39	213.21	215.02	216.83	218.65
GDP (\$Billion)	1,796.19	2,055.00	2,162.60	2,270.20	2,377.80	2,485.40	2,593.00
Health Insurance Coverage (%)	75.57	76.14	76.71	77.29	77.86	78.43	79.00

Number of Doctors/10,000 Population	21.05	21.29	21.51	21.74	21.96	22.18	22.40
Total Healthcare Market (\$Billion)	160.81	184.82	195.39	206.05	216.80	227.63	238.56
Total Medical Devices Market (\$Billion)	5.12	5.58	6.08	6.62	7.21	7.86	8.56

Source: BIS Research Analysis

7.5.6.2 Mexico

Figure: 7.67 Mexico Portable Imaging Solutions Market, 2017-2028



Source: BIS Research Analysis

The preceding figure depicts the Mexico portable imaging solutions market, for 2017-2028. The Mexico portable imaging solutions market was valued at \$29.0 million in 2017 and is anticipated to reach at \$56.8 million by 2028, growing at a CAGR of 6.60% during the forecast period 2018-2028.

Factors such as the rising prevalence of chronic disorders, increasing demand for sophisticated healthcare facilities, improving reimbursement policies are the prime factors driving the market growth of portable imaging solutions in Mexico. However, the shortage of skilled professionals and high

diagnostic cost of procedure are the major obstacles in the growth of Mexico portable imaging solutions market.

Table: 7.19 Macro-Economic Factors Driving the Market Growth of Portable Imaging Solutions in Mexico (2016-2022)

Factors	2016	2017	2018	2019	2020	2021	2022
Population (\$Million)	127.54	128.95	130.36	131.77	133.18	134.59	136.00
GDP (\$Billion)	1,046.92	1,149.00	1,220.20	1,291.40	1,362.60	1,433.80	1,505.00
Health Insurance Coverage (%)	86.43	86.86	87.29	87.71	88.14	88.57	89.00
Number of Doctors/10,000 Population	22.45	22.59	22.73	22.88	23.02	23.16	23.30
Total Healthcare Market (\$Billion)	61.45	67.50	71.74	76.00	80.26	84.52	88.80
Total Medical Devices Market (\$Billion)	4.70	5.16	5.67	6.22	6.83	7.50	8.24

Source: BIS Research Analysis

7.5.6.3 Argentina

Figure: 7.68 Argentina Portable Imaging Solutions Market, 2017-2028



Source: BIS Research Analysis

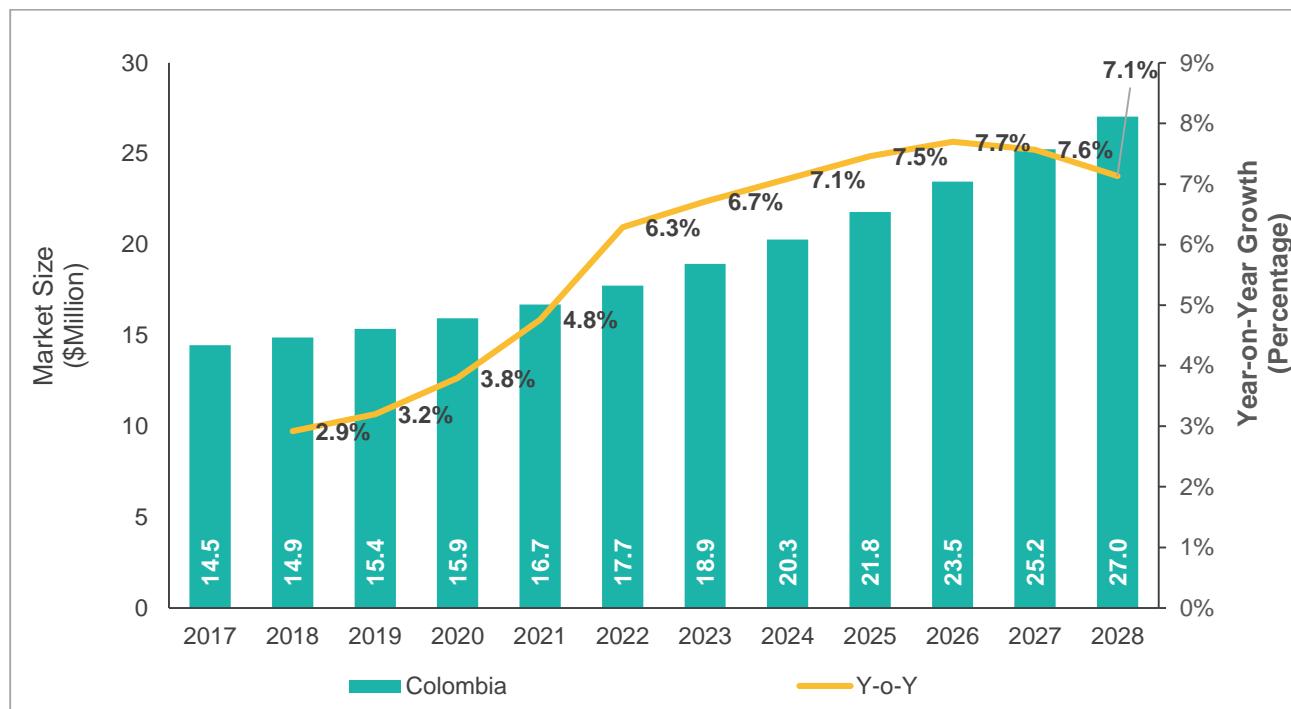
The preceding figure depicts the Argentina portable imaging solutions market, for 2017-2028. The Argentina portable imaging solutions market was valued at \$18.8 million in 2017 and is anticipated to reach at \$39.6 million by 2028, growing at a CAGR of 7.38% during the forecast period 2018-2028.

Contrast to the other Latin American countries, which are contributing significantly to the Latin America portable imaging solutions market, the market for portable imaging solutions in Argentina is anticipated to grow with the fastest CAGR during the forecast period 2018-2028. Argentina has used their economic growth to improve their healthcare technologies. This trend resulted in the increased utilization of advanced technologies in various healthcare verticals, which in turn propels the growth of portable imaging solutions market in Argentina.

Table: 7.20 Macro-Economic Factors Driving the Market Growth of Portable Imaging Solutions in Argentina (2016-2022)

Factors	2016	2017	2018	2019	2020	2021	2022
Population (\$Million)	43.85	44.29	44.73	45.17	45.61	46.05	46.48
GDP (\$Billion)	545.48	637.00	666.80	696.60	726.40	756.20	786.00
Health Insurance Coverage (%)	69.43	69.86	70.29	70.71	71.14	71.57	72.00
Number of Doctors/10,000 Population	39.48	39.62	39.75	39.89	40.03	40.16	40.30
Total Healthcare Market (\$Billion)	37.37	43.75	45.90	48.07	50.25	52.43	54.63
Total Medical Devices Market (\$Billion)	0.66	0.66	0.68	0.70	0.71	0.73	0.74

Source: BIS Research Analysis

7.5.6.4 Colombia
Figure: 7.69 Colombia Portable Imaging Solutions Market, 2017-2028

Source: BIS Research Analysis

The preceding figure depicts the Colombia portable imaging solutions market, for 2017-2028. The Colombia portable imaging solutions market was valued at \$14.5 million in 2017 and is anticipated to reach at \$27.0 million by 2028, growing at a CAGR of 6.16% during the forecast period 2018-2028. Rising incidence rate of chronic disorders and increasing healthcare expenditure are the major factors boosting the growth of portable imaging solutions market in Colombia.

Table: 7.21 Macro-Economic Factors Driving the Market Growth of Portable Imaging Solutions in Colombia (2016-2022)

Factors	2016	2017	2018	2019	2020	2021	2022
Population (\$Million)	48.65	49.14	49.60	50.05	50.51	50.96	51.42
GDP (\$Billion)	282.46	309.00	329.40	349.80	370.20	390.60	411.00
Health Insurance Coverage (%)	57.29	58.57	59.86	61.14	62.43	63.71	65.00



Number of Doctors/10,000 Population	18.70	19.19	19.67	20.15	20.63	21.12	21.60
Total Healthcare Market (\$Billion)	17.50	19.17	20.45	21.73	23.02	24.31	25.61
Total Medical Devices Market (\$Billion)	1.20	1.56	1.93	2.30	2.67	3.03	3.40

Source: BIS Research Analysis

7.5.6.5 Rest-of-Latin America

Figure: 7.70 Rest-of-Latin America Portable Imaging Solutions Market, 2017-2028



Source: BIS Research Analysis

The preceding figure depicts Rest-of- Latin America portable imaging solutions market, for 2017-2028. The Rest-of-Latin America constitutes several emerging economies such as Chile, Costa Rica, Venezuela, Peru, and Ecuador, among others.

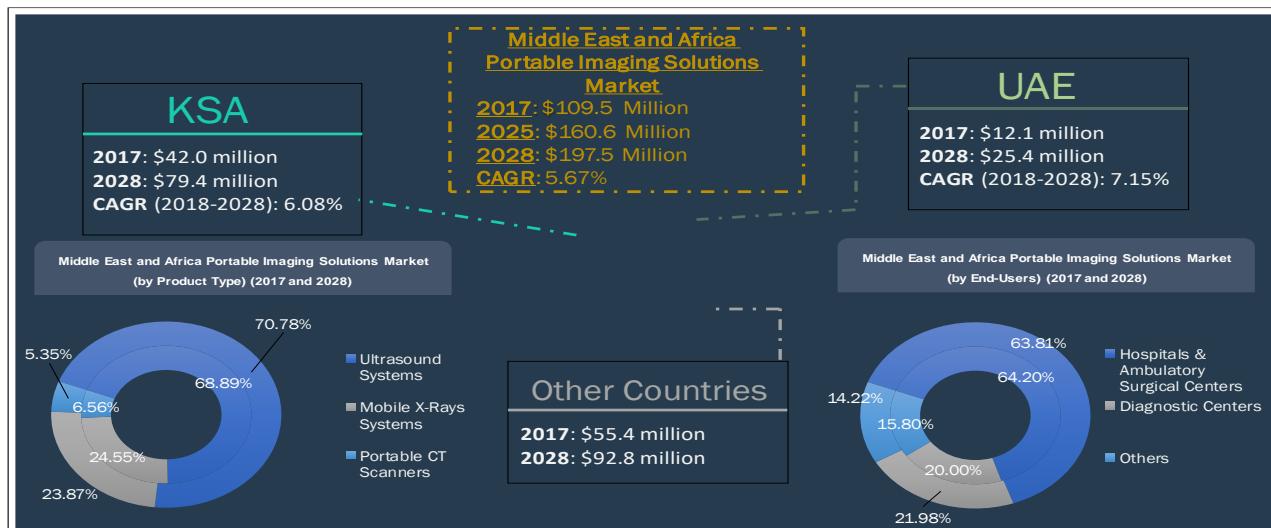
The market for portable imaging solutions in rest-of- Latin America is anticipated grow at a CAGR of 5.71% in the forecast period 2018-2028. In 2017, the market for portable imaging solutions in Rest-of- Latin America was valued to be \$13.5 million and is anticipated to reach \$24.3 million by 2028.

7.6 Middle East & Africa Portable Imaging Solutions Market

7.6.1 Market Snapshot

The Middle East region has always been committed to technological developments and scientific innovation. The ecosystem of the KSA and South Africa is perfect to embrace these new advanced technologies. The region of the Middle East & Africa has been a suitable market for portable imaging solutions because of the acute healthcare challenges faced by it. These healthcare challenges include rising healthcare costs, population growth, and the growing elderly population, among others. These issues have encouraged the government and other organizations to adopt advanced technologies in the healthcare industry.

Figure: 7.71 Market Snapshot: Middle East & Africa Portable Imaging Solutions Market



Source: BIS Research Analysis

Note: Inner circle represents 2017 market size and outer circle represents 2028 market size

Table: 7.22 Macro-Economic Factors Driving the Market Growth of Portable Imaging Solutions in Middle East & Africa (2016-2022)

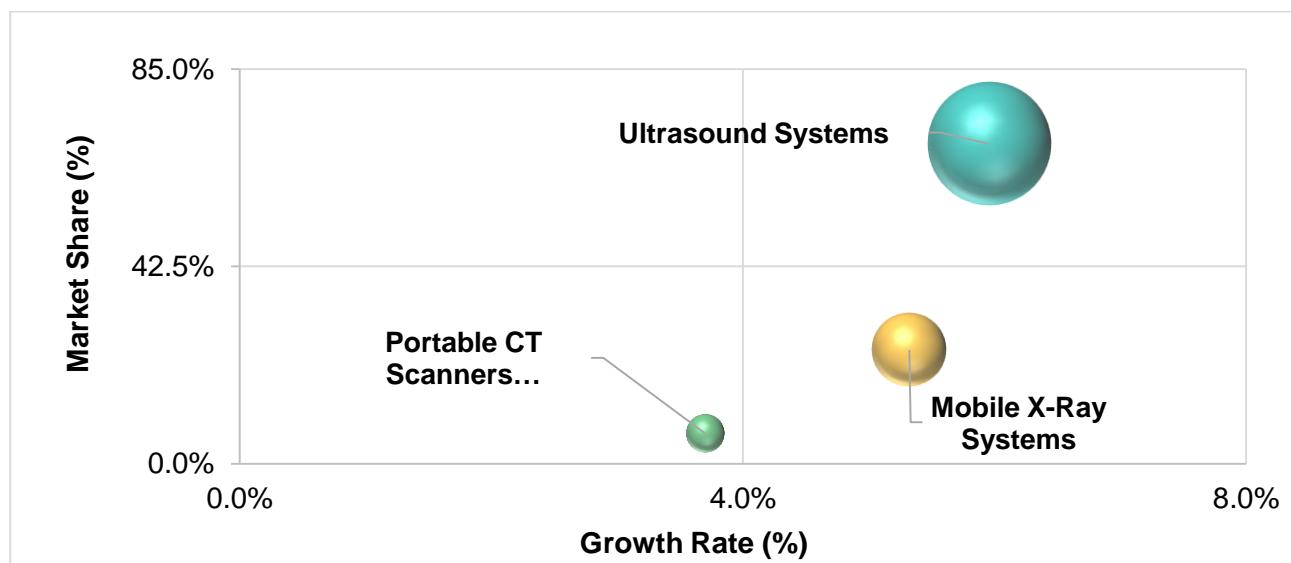
Factors	2016	2017	2018	2019	2020	2021	2022
Population (\$Million)	242.41	247.11	251.45	255.78	260.13	264.46	268.80
GDP (\$Billion)	2,091.68	2,143.30	2,245.80	2,348.30	2,450.90	2,553.40	2,655.90
Health Insurance Coverage (%)	68.63	69.67	70.77	72.09	73.09	74.09	75.07
Number of Doctors/10,000 Population	33.41	33.44	33.49	33.54	33.59	33.65	33.70
Total Healthcare Market (\$Billion)	124.29	130.32	137.02	143.78	150.64	157.58	164.61

Total Medical Devices Market (\$Billion)	6.88	7.91	8.94	9.87	10.89	11.83	12.75
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Source: BIS Research Analysis

7.6.2 Middle East & Africa Portable Imaging Solutions Market (by Product Type) (Market Attractiveness Analysis)

Figure: 7.72 Middle East & Africa: Market Attractiveness Analysis (by Product Type) (2018-2028)



Source: BIS Research Analysis

Ultrasound systems segment is the dominating product type segment for the Middle East & Africa portable imaging solutions market. As of 2017, this segment accounted for 68.89% share of the Middle East & Africa market size, turning in an estimated revenue of \$75.5 million. The above market attractive analysis figure depicts the ultrasound systems segment to have a high market share and a high growth rate. These estimations indicate that the market for ultrasound systems is already replete with a huge number of products addressing the respective needs. This segment is growing with a CAGR of 5.96% during the forecast period 2018-2028.

Mobile X-ray systems are the second-most dominating product type segment for the Middle East & Africa portable imaging solutions market. As of 2017, this segment accounted for 24.55% share of the Middle East & Africa market size, turning in an estimated revenue of \$26.9 million. This segment has become a fast-evolving segment in the Middle East & Africa portable imaging solutions market. The market attractiveness analysis figure given above depicts this segment to have a moderate

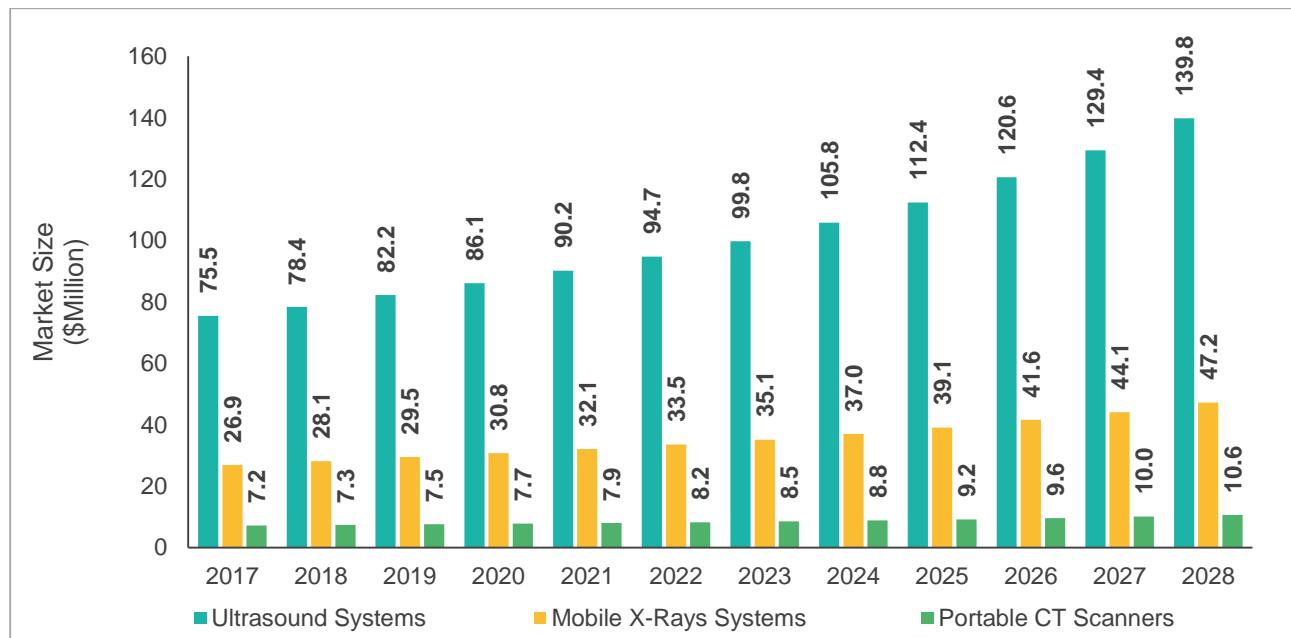
market share and growth-rate among all other product type segments. These estimations indicate that the market for mobile X-ray systems is rapidly evolving and will sustain the growth with a robust CAGR of 5.32% during the forecast period 2018-2028.

As of 2017, portable CT scanners product type segment accounted for 6.56% share of the Middle East & Africa market size, turning in an estimated revenue of \$7.2 million. The market attractiveness analysis figure given above depicts this segment to have a low-moderate market share and growth-rate among all other product type segments. These estimations indicate that the market for portable CT scanners will sustain the growth of CAGR of 3.70% during the forecast period 2018-2028.

7.6.3 Middle East & Africa Portable Imaging Solutions Market (by Product Type)

The Middle East & Africa portable imaging solutions market was valued at \$109.5 million in 2017 and is anticipated to reach \$197.5 million by 2028, growing at a CAGR of 5.67% during the forecast period of 2018-2028.

Figure: 7.73 Middle East & Africa Portable Imaging Solutions Market (by Product Type), 2017-2028



Source: BIS Research Analysis

The preceding figure depicts the Middle East & Africa portable imaging solutions market (by product type), for 2017-2028. As of 2017, the Middle East & Africa portable imaging solutions market by product type was dominated by ultrasound systems. This segment attributed to 68.89% of the total

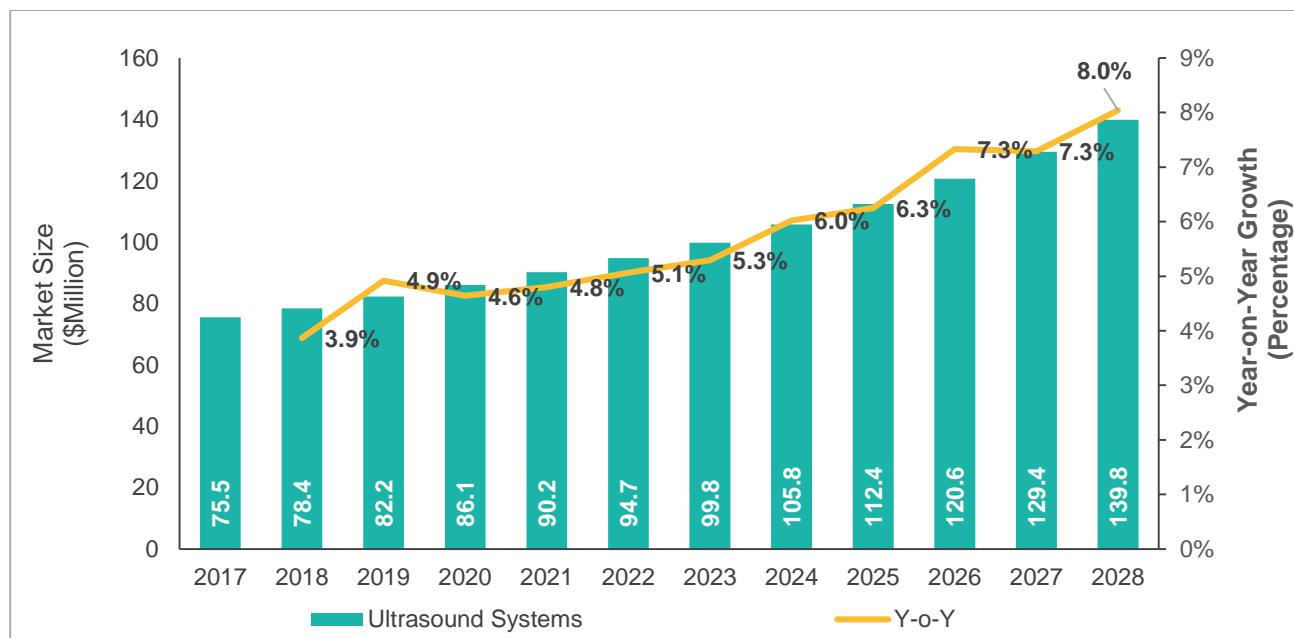
Middle East & Africa portable imaging solutions market (by product type) in 2017. Also, ultrasound segment is anticipated to be the fastest growing segment with CAGR of 5.96% from 2018-2028.

In addition to that, mobile X-ray systems segment was valued at \$26.9 million in 2017 and is estimated to grow to \$47.2 million in 2028 with a CAGR of 5.32% from 2018-2028. Whereas, portable CT scanners segment was valued at \$7.2 million in 2017 and is anticipated to reach \$10.6 million in 2028 with a CAGR of 3.70% from 2018-2028.

The market for portable diagnostic imaging modalities is growing rapidly owing to the various government initiations in healthcare infrastructure projects. The rising prevalence rate and incidence rate of chronic disorders coupled with increasing geriatric population is also propelling the growth of portable imaging solutions market in the Middle East & Africa region.

7.6.3.1 Middle East & Africa Ultrasound Systems Market

Figure: 7.74 Middle East & Africa Portable Imaging Solutions Market (by Ultrasound Systems), 2017-2028

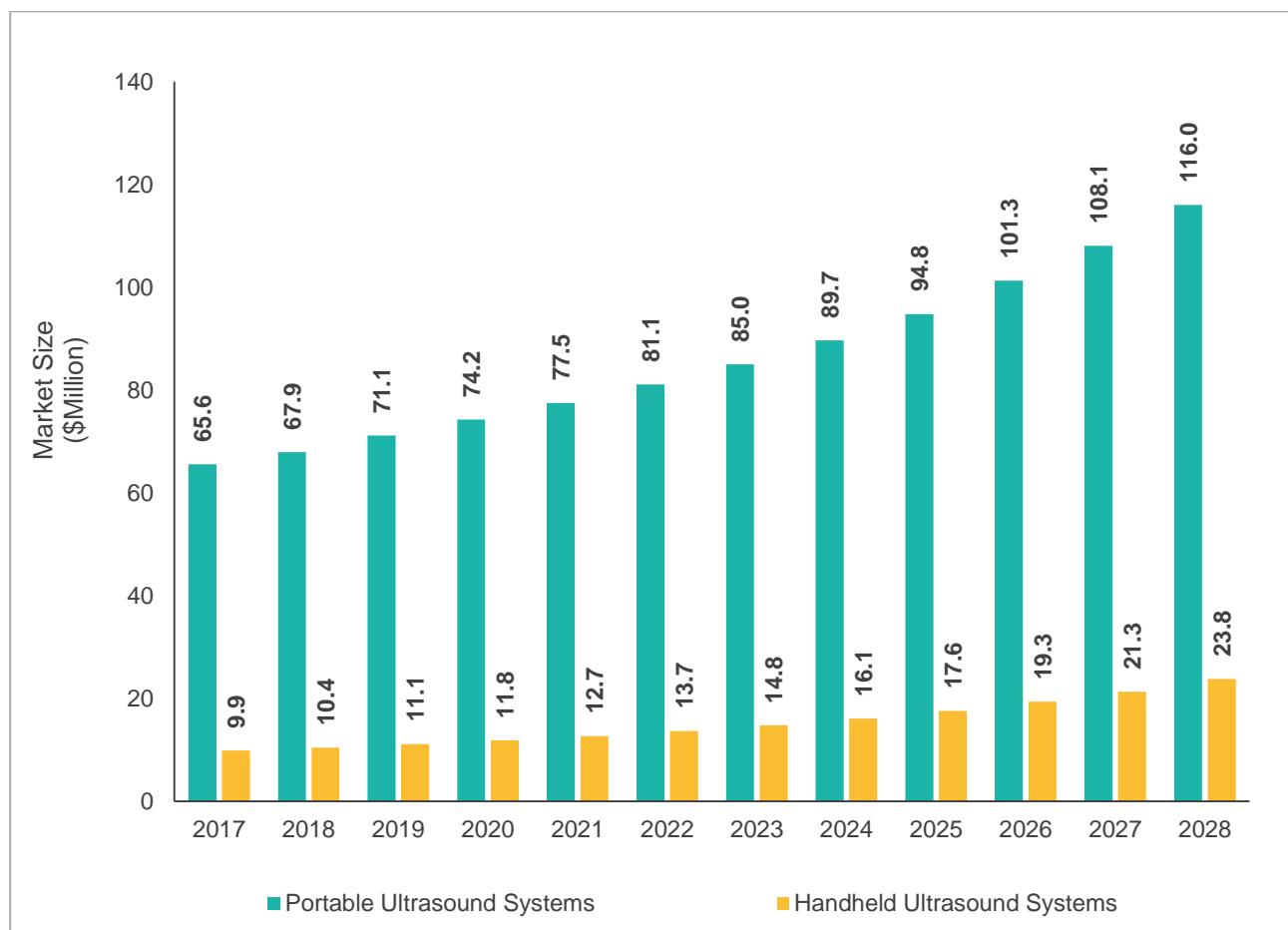


Source: BIS Research Analysis

The preceding figure depicts the Middle East & Africa portable imaging solutions market (by ultrasound systems), for 2017-2028. The ultrasound segment of the Middle East & Africa portable imaging solutions market was valued at \$75.5 million in 2017 and is anticipated to reach \$139.8 million by 2028, growing at a CAGR of 5.96% during the forecast period 2018-2028.

The ultrasound systems are the fastest growing segment in the Middle East & Africa portable imaging solutions market. The changing healthcare infrastructure pertaining to the use of advanced technologies in healthcare facilities are boosting the growth of the Middle East & Africa ultrasound systems market.

Figure: 7.75 Middle East & Africa Portable Imaging Solutions Market (by Portable Ultrasound Systems and Handheld Ultrasound Systems), 2017-2028



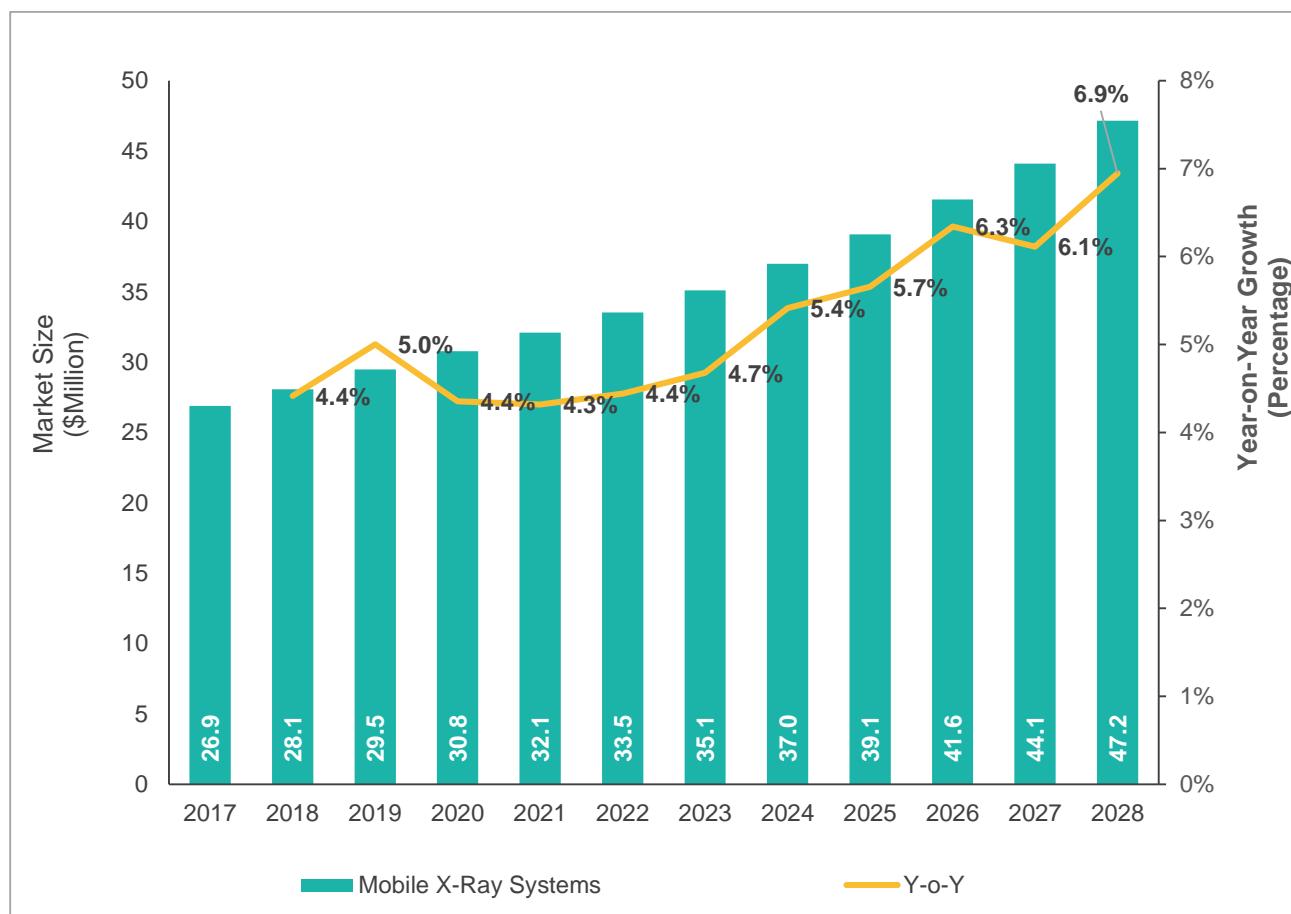
Source: BIS Research Analysis

The preceding figure depicts the Middle East & Africa portable imaging solutions market (by portable ultrasound systems and handheld ultrasound systems), for 2017-2028. The Middle East & Africa portable ultrasound systems market was estimated to have a value of \$65.6 million, in 2017. The market is expected to grow at a CAGR of 5.50% during the forecast period 2018-2028 and attain a value of \$116.0 million by 2028.

Whereas, handheld ultrasound systems market is anticipated to grow at the fastest rate within the Middle East & Africa ultrasound systems market attaining a CAGR of 8.58% during the forecast period 2018-2028.

7.6.3.2 Middle East & Africa Mobile X-Ray Systems Market

Figure: 7.76 Middle East & Africa Portable Imaging Solutions Market (by Mobile X-Ray Systems), 2017-2028

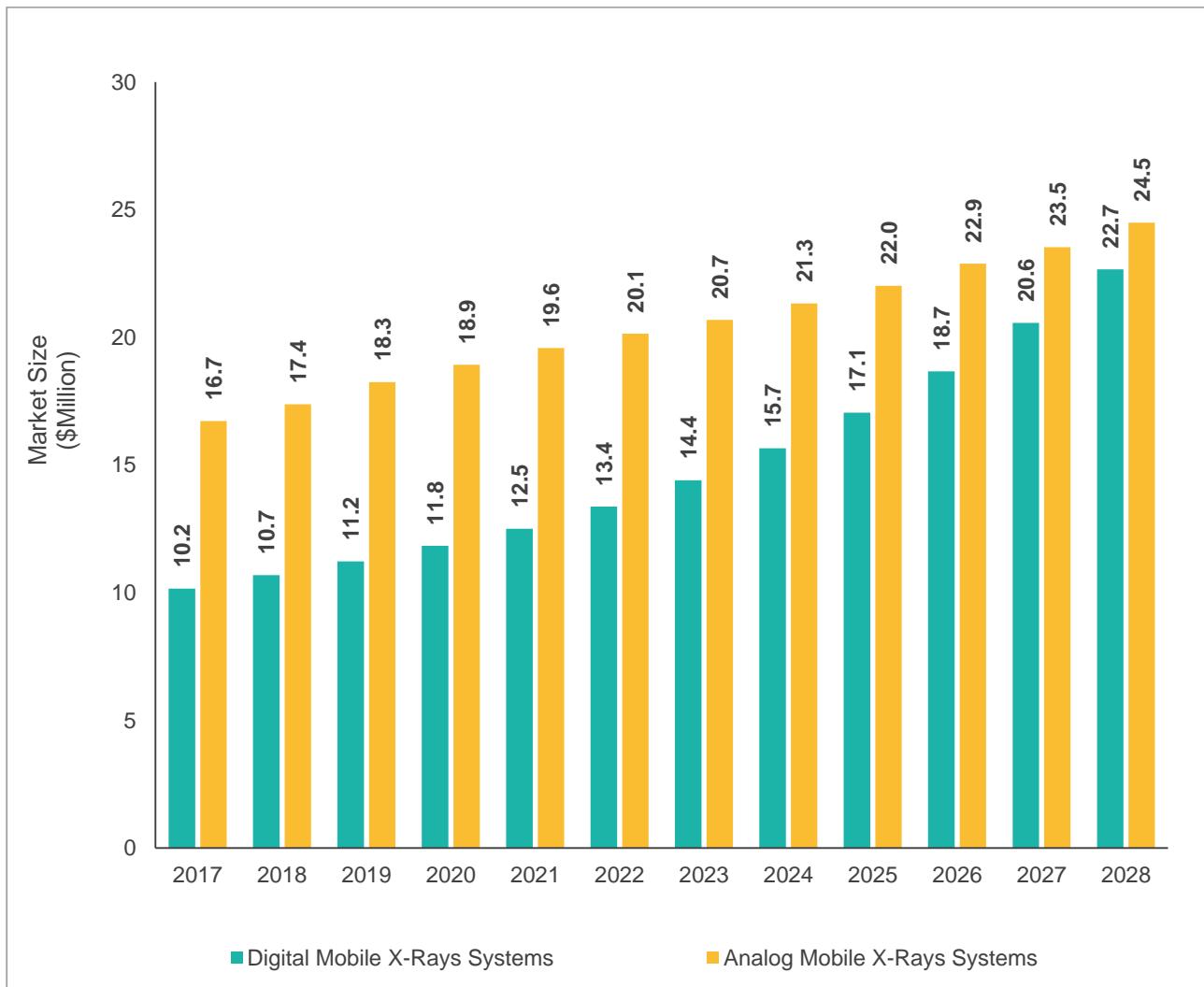


Source: BIS Research Analysis

The preceding figure depicts the Middle East & Africa portable imaging solutions market (by mobile X-ray systems), for 2017-2028. The mobile X-ray systems segment of the Middle East & Africa portable imaging solutions market was valued at \$26.9 million in 2017 and is anticipated to reach \$47.2 million by 2028, growing at a CAGR of 5.32% during the forecast period of 2018-2028.

This growth is attributed to the increased adoption of digital mobile x-ray systems over the analog x-ray systems mobile among various healthcare facilities as it offers high quality of care by reducing radiation exposure by 75% or more.

Figure: 7.77 Middle East & Africa Portable Imaging Solutions Market (by Analog Mobile X-Ray and Digital Mobile X-Ray Systems), 2017-2028



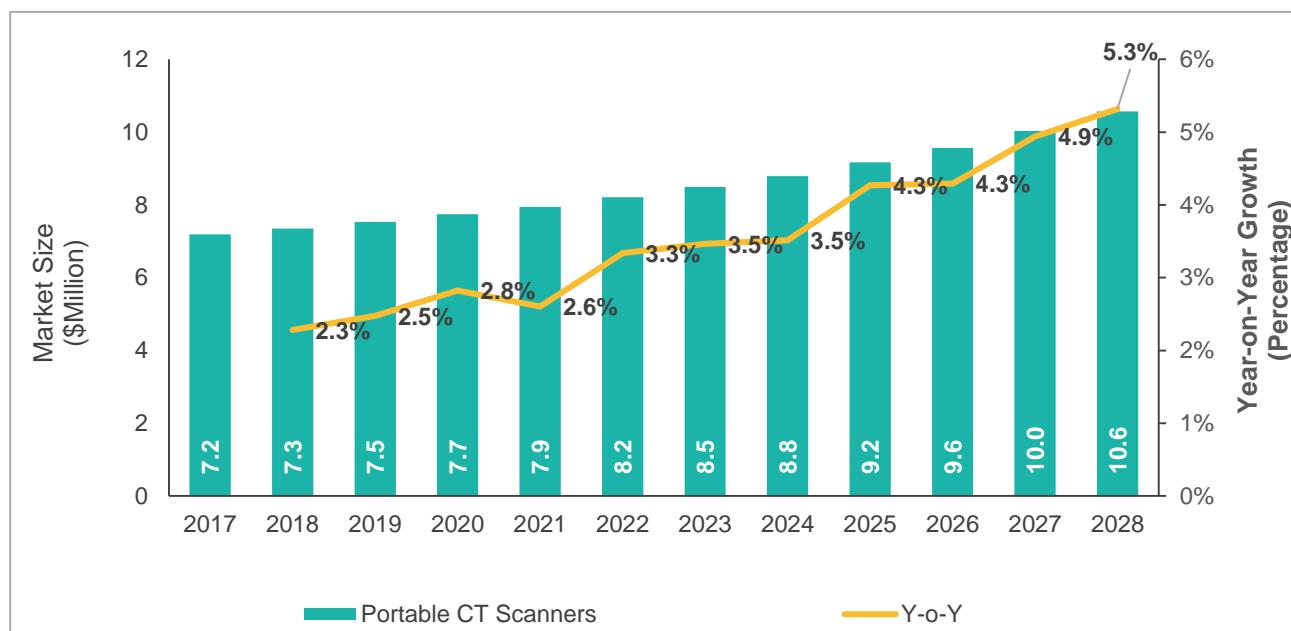
Source: BIS Research Analysis

The preceding figure depicts the Middle East & Africa portable imaging solutions market (by analog mobile X-ray systems and digital mobile X-ray systems), for 2017-2028. The analog mobile X-ray systems market was estimated to have a value of \$16.7 million, in 2017. The market is expected to grow at a CAGR of 3.49% during the forecast period 2018-2028 and attain a value of \$24.5 million by 2028.

Whereas, the digital mobile X-ray systems market is anticipated to grow at the fastest rate within the Middle East & Africa mobile X-ray systems market attaining a CAGR of 7.80% during the forecast period 2018-2028.

7.6.3.3 Middle East & Africa Portable CT Scanners Market

Figure: 7.78 Middle East & Africa Portable Imaging Solutions Market (by Portable CT Scanners), 2017-2028

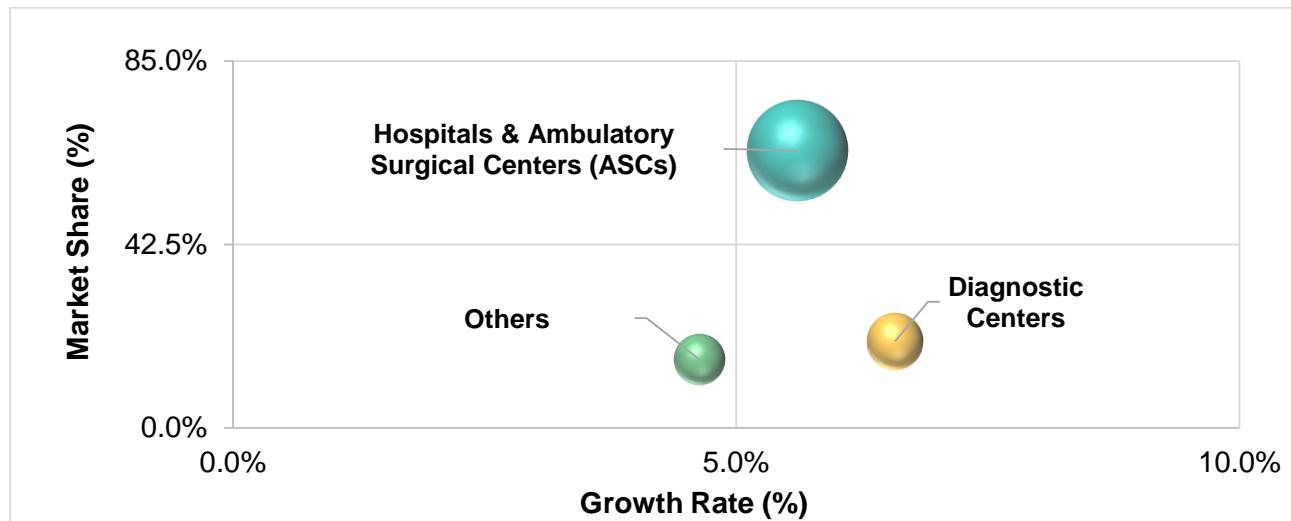


Source: BIS Research Analysis

The preceding figure depicts the Middle East & Africa portable imaging solutions market (by portable CT scanners), for 2017-2028. The portable CT scanners segment of the Middle East & Africa portable imaging solutions market was valued at \$7.2 million in 2017 and is anticipated to reach \$10.6 million by 2028, growing at a CAGR of 3.70% during the forecast period of 2018-2028. The Middle East & Africa holds the fifth largest share in global portable CT scanners market, with 5.27% in 2017.

7.6.4 Middle East & Africa Portable Imaging Solutions Market (by End-Users) (Market Attractiveness Analysis)

Figure: 7.79 Middle East & Africa: Market Attractiveness Analysis (by End-Users) (2018-2028)



Source: BIS Research Analysis

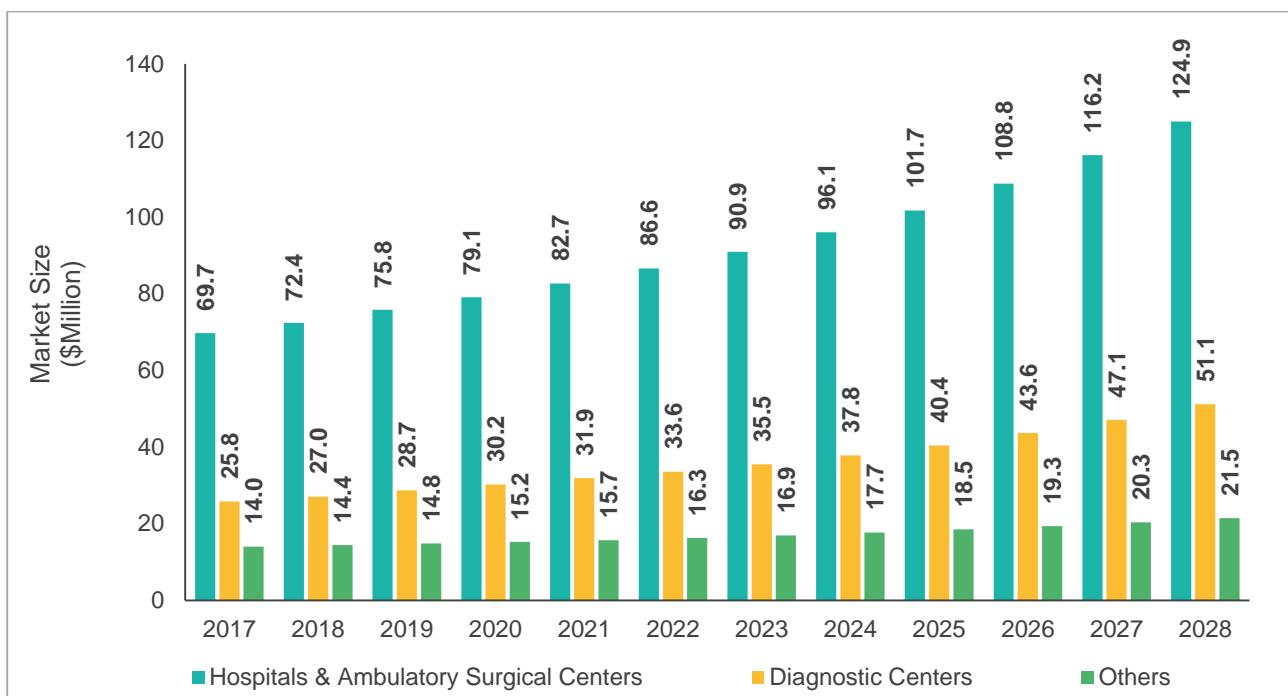
Hospitals and ambulatory surgical centers segment is the dominating end-user segment for the Middle East & Africa portable imaging solutions market. As of 2017, this segment accounted for 63.64% share of the Middle East & Africa market size, turning in an estimated revenue of \$69.7 million. The market attractive analysis figure given above depicts the hospitals and ambulatory surgical centers segment to have a high market share and moderate growth rate. This segment is growing with a CAGR of 5.61% during the forecast period 2018-2028.

Diagnostic centers are the second-most dominating end-user segment for the Middle East & Africa portable imaging solutions market. As of 2017, this segment accounted for 23.56% share of the Middle East & Africa market size, turning in an estimated revenue of \$25.8 million. This segment has become a fast-evolving segment in the Middle East & Africa portable imaging solutions market. The market attractiveness analysis figure depicts the segment to have a moderate market share and the fastest growth rate of 6.58% during the forecast period 2018-2028.

As of 2017, others end-user segment accounted for 12.80% share of the Middle East & Africa market size, turning in an estimated revenue of \$14.0 million. The market attractiveness analysis figure depicts this segment to have a low-moderate market share and growth rate. These estimations indicate that the market in others end-user segment will sustain the growth of CAGR of 4.07% during the forecast period 2018-2028.

7.6.5 Middle East & Africa Portable Imaging Solutions Market (by End-User)

Figure: 7.80 Middle East & Africa Portable Imaging Solutions Market (by End-User), 2017-2028



Source: BIS Research Analysis

The preceding figure depicts the Middle East & Africa portable imaging solutions market (by end-user), for 2017-2028. As of 2017, the Middle East & Africa portable imaging solutions market by end-user was dominated by hospitals and ambulatory surgical centers. This segment attributed to 63.64% of the total Middle East & Africa portable imaging solutions market (by end-user) in 2017. Also, hospitals and ambulatory surgical centers segment is anticipated to be the moderate growing segment with CAGR of 5.61% from 2018-2028.

In addition to that, diagnostic centers segment was valued at \$25.8 million in 2017 and is estimated to grow to \$51.1 million in 2028 with a CAGR of 6.58% from 2018-2028 Whereas, others end-user segment was valued at \$14.0 million in 2017 and is anticipated to reach \$21.5 million in 2028 with a CAGR of 4.07% from 2018-2028.

7.6.6 Middle East & Africa Portable Imaging Solutions Market (by Country) (Market Attractiveness Analysis)

Figure: 7.81 Middle East & Africa: Market Attractiveness Analysis (by Country) (2018-2028)



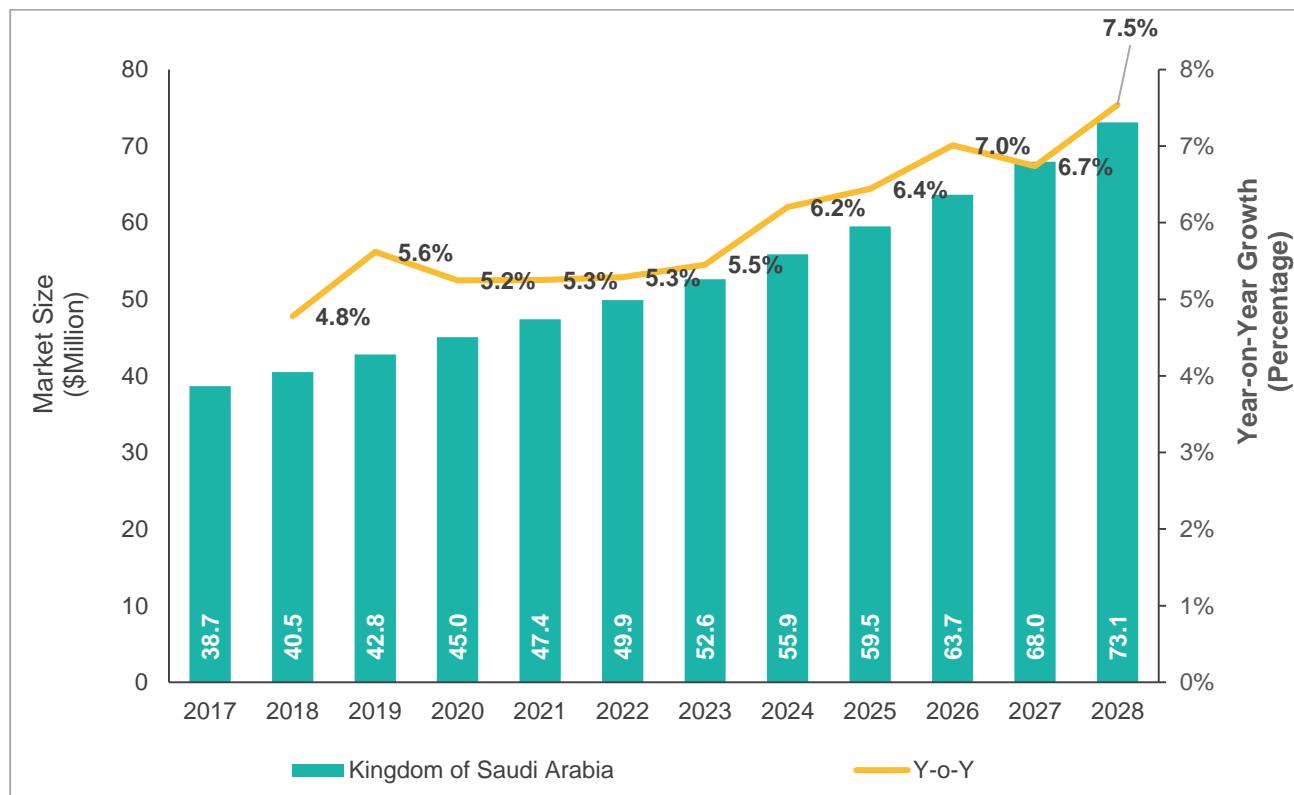
Source: BIS Research Analysis

The preceding figure depicts the Middle East & Africa portable imaging solutions market, for 2017-2028. The market attractiveness analysis for the Middle East & Africa portable imaging solutions market has been done for the major contributing countries in the Middle East & Africa, namely KSA, U.A.E., South Africa, Egypt, Israel, and Turkey, among others.

The Middle East & Africa region is the fifth largest market for portable imaging solutions, accounted for a 4.50% share as of 2017. In the Middle East & Africa region, U.A.E. is anticipated to be the fastest growing market for portable imaging solutions, growing at a CAGR of 7.17% during the forecast period 2018-2028. The exponential growth of this market is being driven by an increasing trend of point-of-care applications, rising demand for high quality of care among patient population, and changing regulatory and reimbursement policies.

7.6.6.1 Kingdom of Saudi Arabia (KSA)

Figure: 7.82 KSA Portable Imaging Solutions Market, 2017-2028



Source: BIS Research Analysis

The preceding figure depicts the KSA portable imaging solutions market, for 2017-2028. The KSA portable imaging solutions market was valued at \$38.7 million in 2017 and is anticipated to reach at \$73.1 million by 2028, growing at a CAGR of 6.08% during the forecast period 2018-2028.

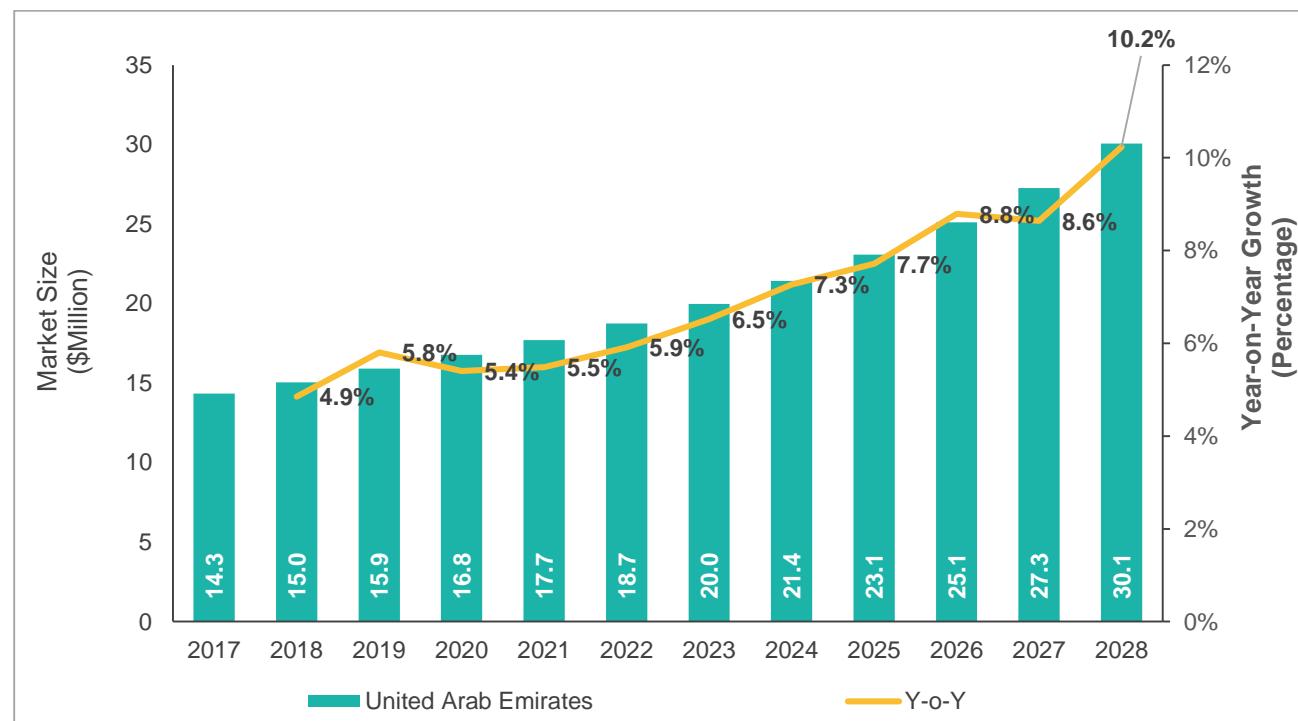
The country holds the largest economy in the Middle East & Africa region and a significant potential for expansion by key players of the global portable imaging solutions market. Almost all key players in the market are focused on making investment strategies to expand its reach in the market of KSA.

Table: 7.23 Macro-Economic Factors Driving the Market Growth of Portable Imaging Solutions in KSA (2016-2022)

Factors	2016	2017	2018	2019	2020	2021	2022
Population (\$Million)	32.28	33.17	33.99	34.80	35.62	36.44	37.25
GDP (\$Billion)	646.44	683.00	712.80	742.60	772.40	802.20	832.00
Health Insurance Coverage (%)	30.00	32.50	35.00	37.50	40.00	42.50	45.00
Number of Doctors/10,000 Population	27.78	27.85	27.92	27.99	28.06	28.13	28.20
Total Healthcare Market (\$Billion)	37.95	40.36	42.39	44.45	46.53	48.63	50.75
Total Medical Devices Market (\$Billion)	2.00	2.42	2.83	3.25	3.67	4.08	4.50

Source: BIS Research Analysis

7.6.6.2 United Arab Emirates (U.A.E.)

Figure: 7.83 U.A.E. Portable Imaging Solutions Market, 2017-2028

Source: BIS Research.

The preceding figure depicts the U.A.E. portable imaging solutions market, for 2017-2028. The U.A.E. portable imaging solutions market was valued at \$14.3 million in 2017 and is anticipated to reach at \$30.1 million by 2028, growing at a CAGR of 7.17% during the forecast period 2018-2028.

The healthcare sector of U.A.E. has exponentially expanded over the last four decades. According to the estimates of Federal Competitiveness and Statistics Authority (Dubai), U.A.E. has over 126 private and public hospitals with a capacity of more than 12,000 beds. This growth is attributed to increasing overall population and demographic shift towards the aging population. For instance, according to the estimated of World Bank, U.A.E. elderly population will shift from 1.4% in 2018 to 4.4% by 2030.

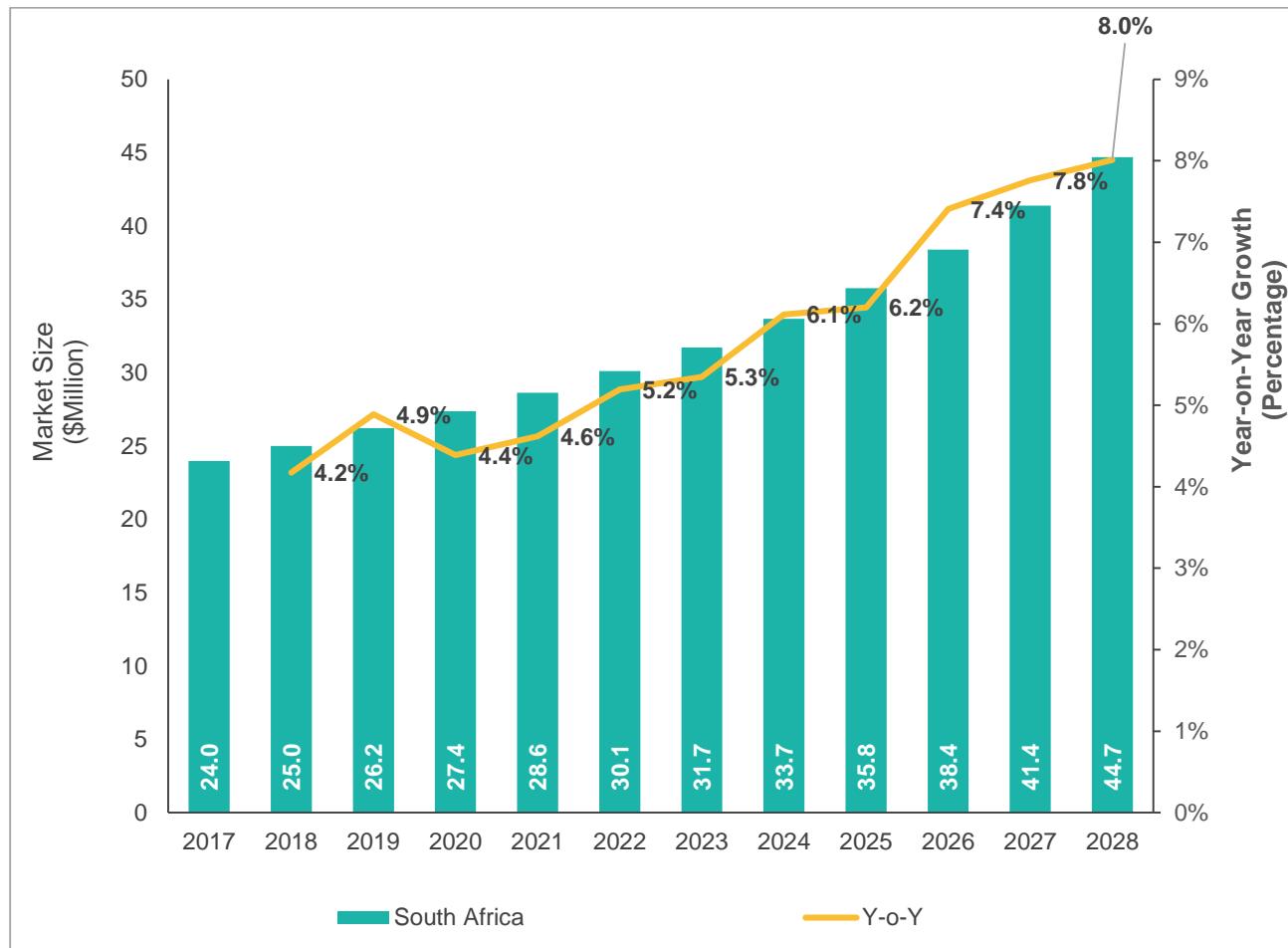
Table: 7.24 Macro-Economic Factors Driving the Market Growth of Portable Imaging Solutions in U.A.E. (2016-2022)

Factors	2016	2017	2018	2019	2020	2021	2022
Population (\$Million)	9.27	9.50	9.64	9.79	9.94	10.09	10.23
GDP (\$Billion)	348.74	377.00	399.80	422.60	445.40	468.20	491.00
Health Insurance Coverage (%)	95.00	95.50	96.00	96.50	97.00	97.50	98.00
Number of Doctors/10,000 Population	15.76	15.85	15.94	16.03	16.12	16.21	16.30
Total Healthcare Market (\$Billion)	12.30	13.53	14.60	15.70	16.82	17.97	19.15
Total Medical Devices Market (\$Billion)	0.74	0.86	0.98	1.10	1.21	1.33	1.45

Source: BIS Research Analysis

7.6.6.3 South Africa

Figure: 7.84 South Africa Portable Imaging Solutions Market, 2017-2028



Source: BIS Research Analysis

The preceding figure depicts the South Africa portable imaging solutions market, for 2017-2028. The South Africa portable imaging solutions market was valued at \$24.0 million in 2017 and is anticipated to reach at \$44.7 million by 2028, growing at a CAGR of 5.99% during the forecast period 2018-2028.

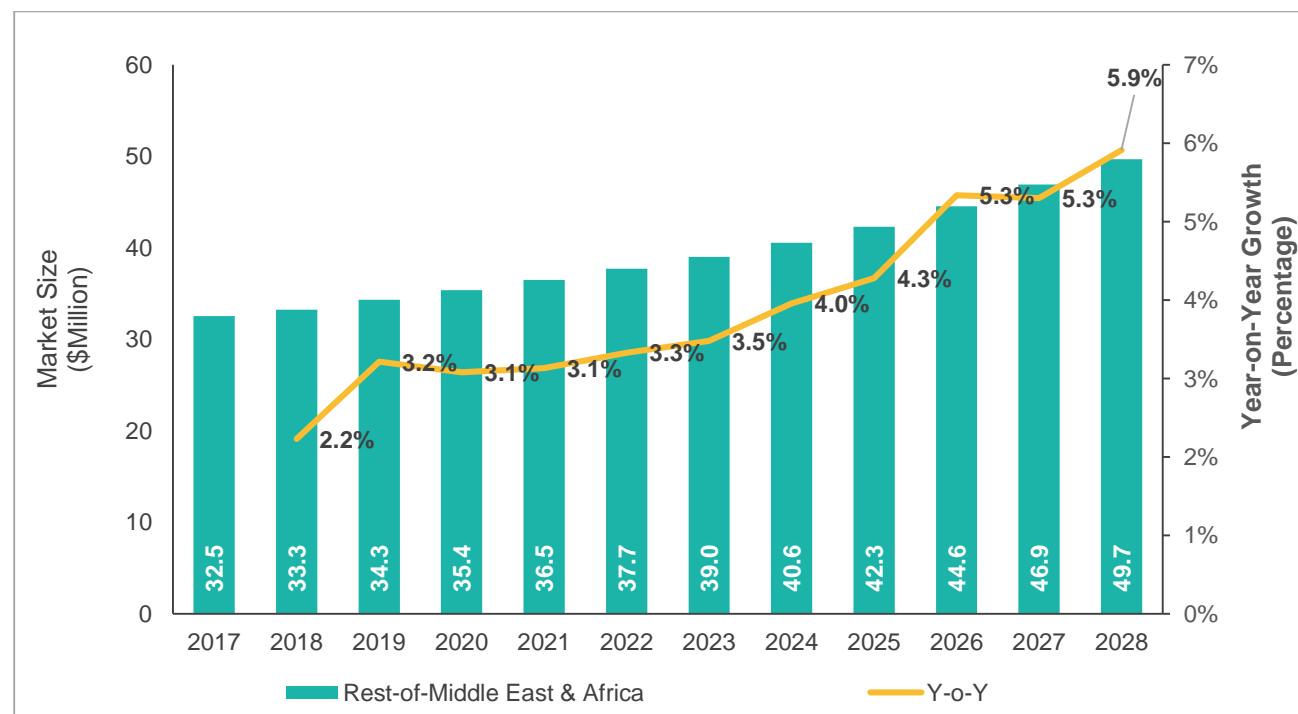
South Africa is considered one of the wealthiest African economy whose healthcare sector is well-developed as compared to any other African nation. The medical devices market in South Africa is supervised by the South African Medical Device Industry Association (SAMED), which involves more than 160 companies operating in medical equipment and devices sector and in-vitro diagnostic sectors. This association helps in the development of sustainable medical device industry by enhancing patient access to advanced medical technologies.

Table: 7.25 Macro-Economic Factors Driving the Market Growth of Portable Imaging Solutions in South Africa (2016-2022)

Factors	2016	2017	2018	2019	2020	2021	2022
Population (\$Million)	56.02	56.76	57.51	58.26	59.00	59.75	60.49
GDP (\$Billion)	295.46	349.00	368.80	388.60	408.40	428.20	448.00
Health Insurance Coverage (%)	86.18	87.48	88.79	90.12	91.47	92.84	94.24
Number of Doctors/10,000 Population	81.80	81.88	81.97	82.05	82.13	82.22	82.30
Total Healthcare Market (\$Billion)	24.36	28.92	30.72	32.53	34.37	36.21	38.08
Total Medical Devices Market (\$Billion)	1.10	1.32	1.53	1.75	1.97	2.18	2.40

Source: BIS Research Analysis

7.6.6.4 Rest-of-Middle East & Africa

Figure: 7.85 Rest-of- Middle East & Africa Portable Imaging Solutions Market, 2017-2028


Source: BIS Research Analysis

The preceding figure depicts the Rest-of- Middle East & Africa portable imaging solutions market, for 2017-2028. The Rest-of- Middle East & Africa constitutes several emerging economies such as Israel, Turkey, Egypt, Jordan, and Kuwait, among others.

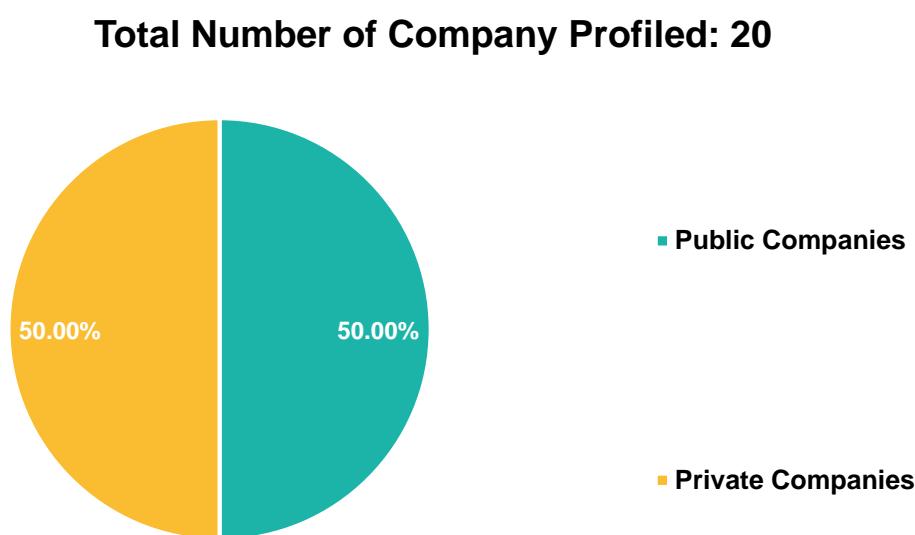
The market for portable imaging solutions in Rest-of- Middle East & Africa is anticipated grow at a CAGR of 4.10% in the forecast period 2018-2028. In 2017, the market for portable imaging solutions in Rest-of- Middle East & Africa was valued to be \$32.5 million and is anticipated to reach \$49.7 million by 2028.

8. Company Profile

8.1 Overview

This section includes company profiles for ten public companies and ten private companies. Each company profile detail includes overview table, role of company in the market, company's operating segment and sub-segments, financials, financial summary, and SWOT analysis.

The company profiles comprise 20 key manufacturers of portable imaging solutions. The following figure demonstrates the total number of company profiles and their holding types.



Source: BIS Research Analysis

List of public company profiles includes: Analogic Corporation, Canon Inc., Fujifilm Holdings Corporation, General Electric Company, Hitachi, Ltd., Konica Minolta, Inc., Koninklijke Philips N.V., Samsung Electronics Co., Ltd, Shimadzu Corporation, and Siemens Healthineers, Inc.

List of private company profiles includes: Butterfly Network, Inc., Carestream Health, Inc., Clarius Mobile Health Corp., EchoNous, Inc., Esaote SpA, Healcerion, Inc., Mindray Medical International Limited, Teratech Corporation, Whale Imaging, Inc, and Xoran Technologies, LLC.



8.2 Analogic Corporation

8.2.1 Company Overview

Particular	Specifications (as of FY2017)
Website	www.analogic.com
Headquarters	Massachusetts, U.S.
Year of Establishment	1967
Ownership Type	Public
Net Revenue	\$486.4 Million
Number of Employees	1,510
Subsidiaries	Analogic China Holding Limited, Analogic Canada Corporation, BK Medical Holding ApS (Denmark), B-K Medical AB (Sweden), and BK Ultrasound Africa and Middle East FZ-LLC (U.A.E.), among others

Source: *Analogic Corporation Website and BIS Research Analysis*

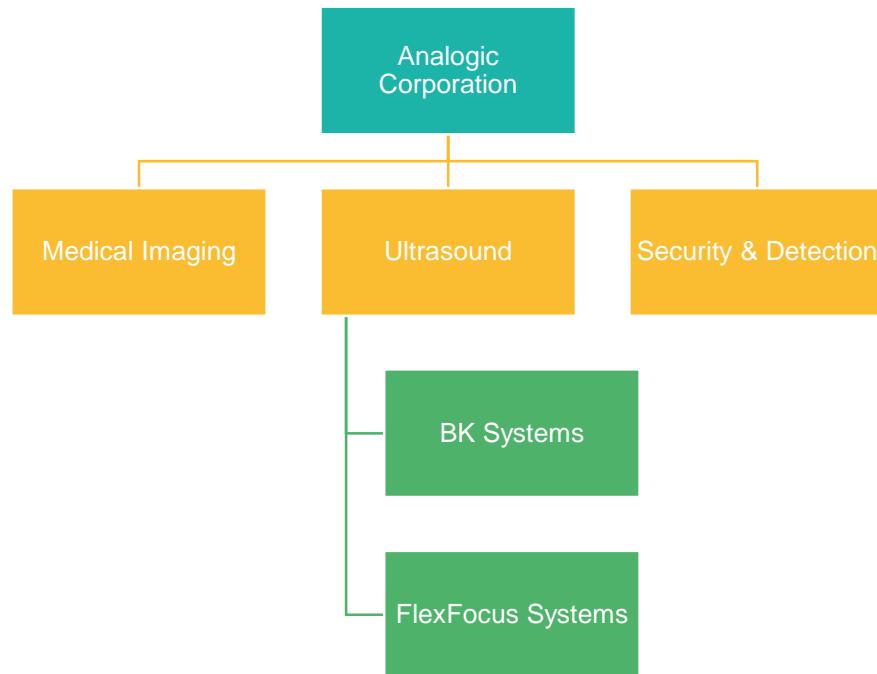
8.2.2 Role of Analogic Corporation in the Portable Imaging Solutions Market

Analogic Corporation is a manufacturer of real-time guidance systems, diagnostic imaging systems, and threat detection technologies. The company operates through three reportable segments i.e. Medical Imaging, Ultrasound, and Security and Detection.

Catering to portable imaging solutions market, the company offers portable ultrasound systems and transducers under the brand name of BK ultrasound. Analogic Corporation accounted for an estimated 3.23% share of the global market value in 2017. This is attributed to the diverse range of product portfolio within the portable ultrasound systems market. Further, the company is mainly focused on their three ultrasound systems, namely, bk3000 ultrasound systems for urology applications, bk5000 ultrasound systems for surgery applications, and bk3500 ultrasound systems for anesthesia applications.

Some of the leading competitors of the company contributing significantly to the portable imaging solutions market include Canon Inc., Fujifilm Holdings Corporation, General Electric Company, Hitachi, Ltd., Konica Minolta, Inc., Mindray Medical International Limited, and Koninklijke Philips N.V., among others.

Figure: 8.1 Analogic Corporation - Product Portfolio for Portable Imaging Solutions Market



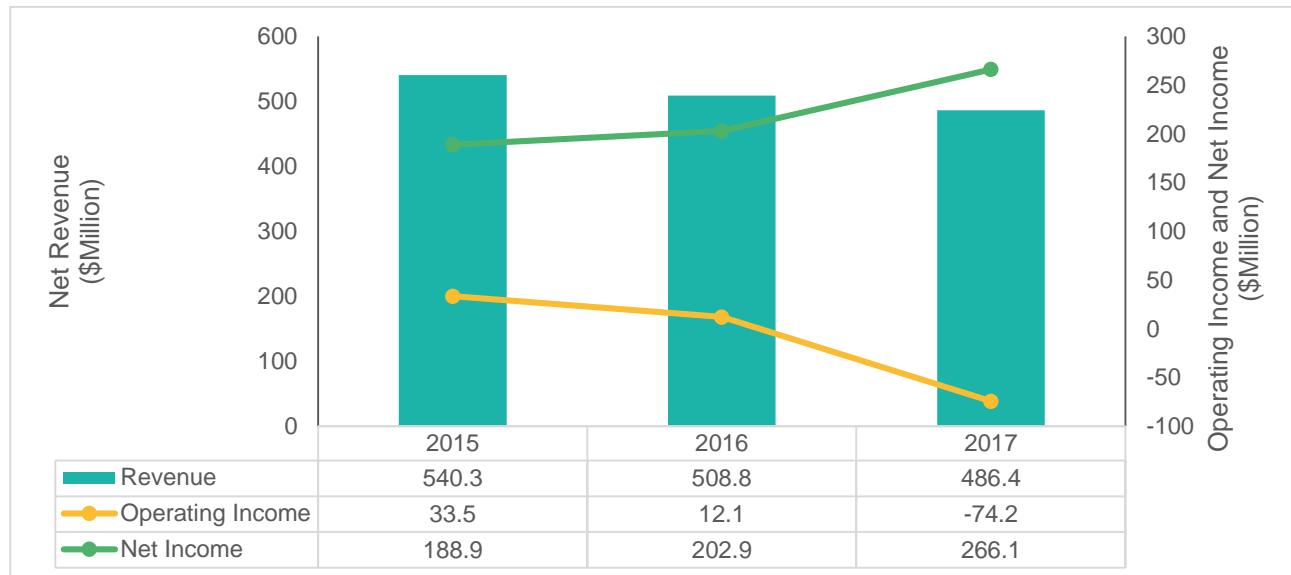
Source: Analogic Corporation Website and BIS Research Analysis

The company's ultrasound systems are sold under the brand name of BK ultrasound which consists of two product families: BK Systems and FlexFocus Systems. In 2017, the company underwent product portfolio optimization and as a result of this, the company has decided to forgo further investment in the handheld Sonic Window product for the dialysis market. Along with this, the company has also discontinued the sales of new ultrasound systems in the veterinary segment.

Further, company's direct sales force in the U.S., Canada, Germany, Belgium, U.K., Italy, and Scandinavia accounted for nearly 64% of the total ultrasound sales in 2017.

8.2.3 Financials

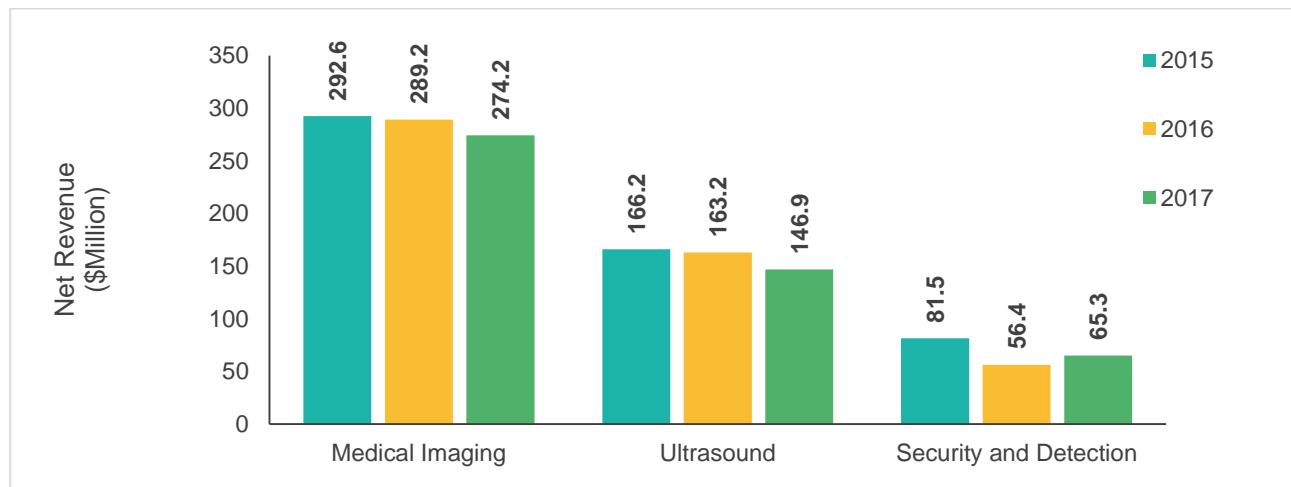
Figure: 8.2 Analogic Corporation - Overall Financials, 2015-2017



Source: Analogic Corporation Website and BIS Research Analysis

The financial year (FY) of the company starts from 1st June and ends on 31st July. The company generated a net revenue of \$486.4 million for the FY2017. The company reported a net decrease of \$22.48 million that is 4.42% of decrease in its revenue in FY2017 from FY2016, driven primarily by decreased sales in ultrasound segment, OEM probes, and medical imaging segment.

Figure: 8.3 Analogic Corporation - Revenue (by Segment), 2015-2017



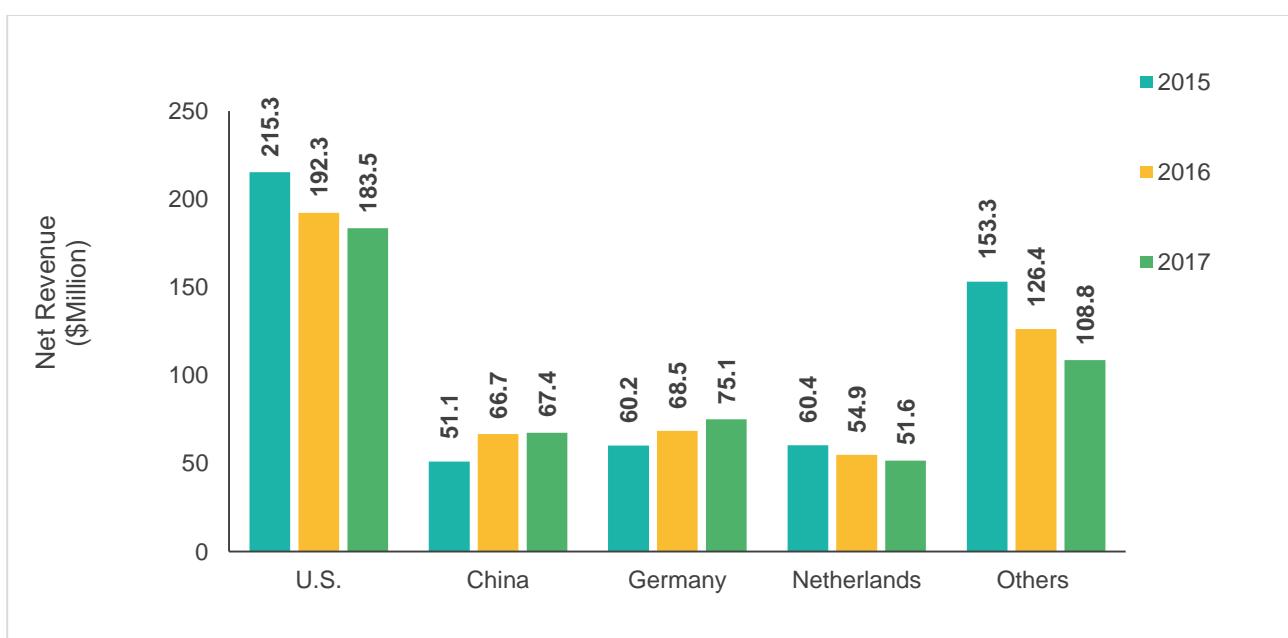
Source: Analogic Corporation Website and BIS Research Analysis

The company reports its operations under three reportable segments, namely, Medical Imaging, Ultrasound, and Security & Detection. The Medical Imaging segment generated a net revenue of \$274.2 million in FY2017, reporting a decline of 5.19% when compared with that of FY2016. This is attributed to the decreased sales in the computed tomography, magnetic resonance imaging, and digital mammography systems.

The Ultrasound segment generated a net revenue of \$146.9 million in FY2017, reporting a decline of 9.99% when compared with that of FY2016. This is attributed to the decreased sales in private label and OEM probes.

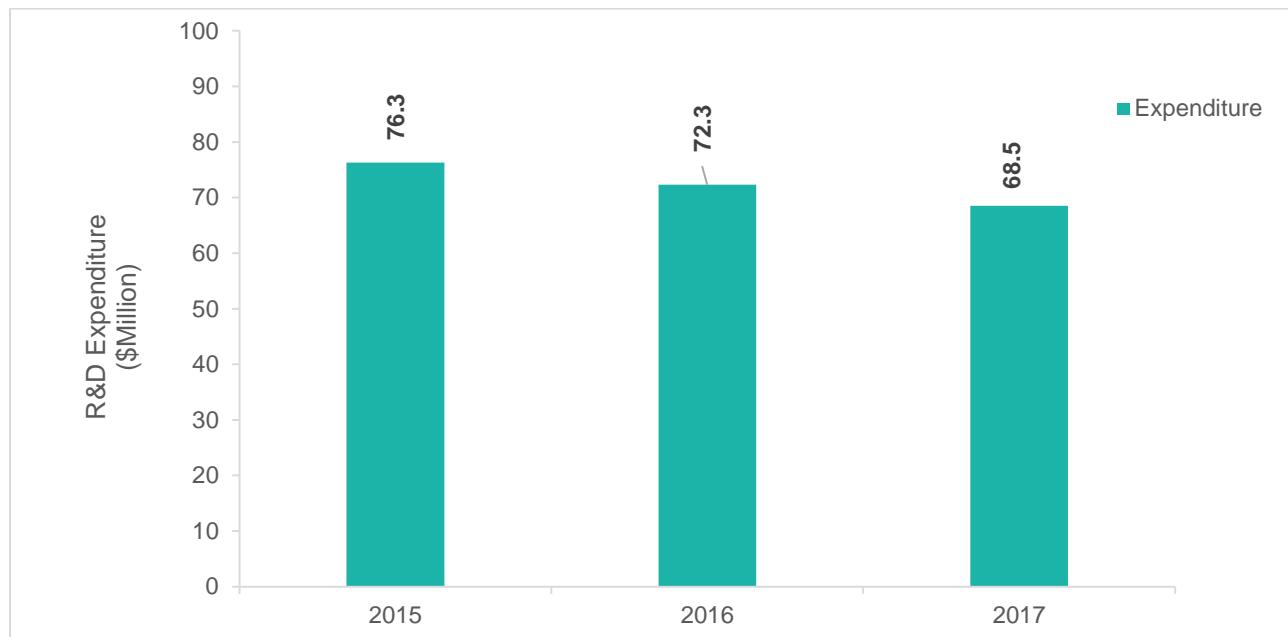
The Security & Detection segment generated a net revenue of \$65.3 million in FY2017, reporting a rise of 15.78% when compared with that of FY2016. This is attributed to the increased sales in airport screening systems and rapid DNA systems.

Figure: 8.4 Analogic Corporation - Revenue (by Region), 2015-2017



Source: Analogic Corporation Website and BIS Research Analysis

The company reports its regional operations in five segments: U.S., China, Germany, Netherlands, and Others. U.S. generated a revenue of \$183.5 million in FY2017, reporting a decline of 4.58% from that of FY2016. China generated a revenue of \$67.4 million in FY2017, reporting a rise of 1.05% from that of FY2016. Germany generated a revenue of \$75.1 million in FY2017, reporting a rise of 9.64% from that of FY2016. Netherlands generated a revenue of \$51.6 million in FY2017, reporting a decline of 6.01% from that of FY2016.

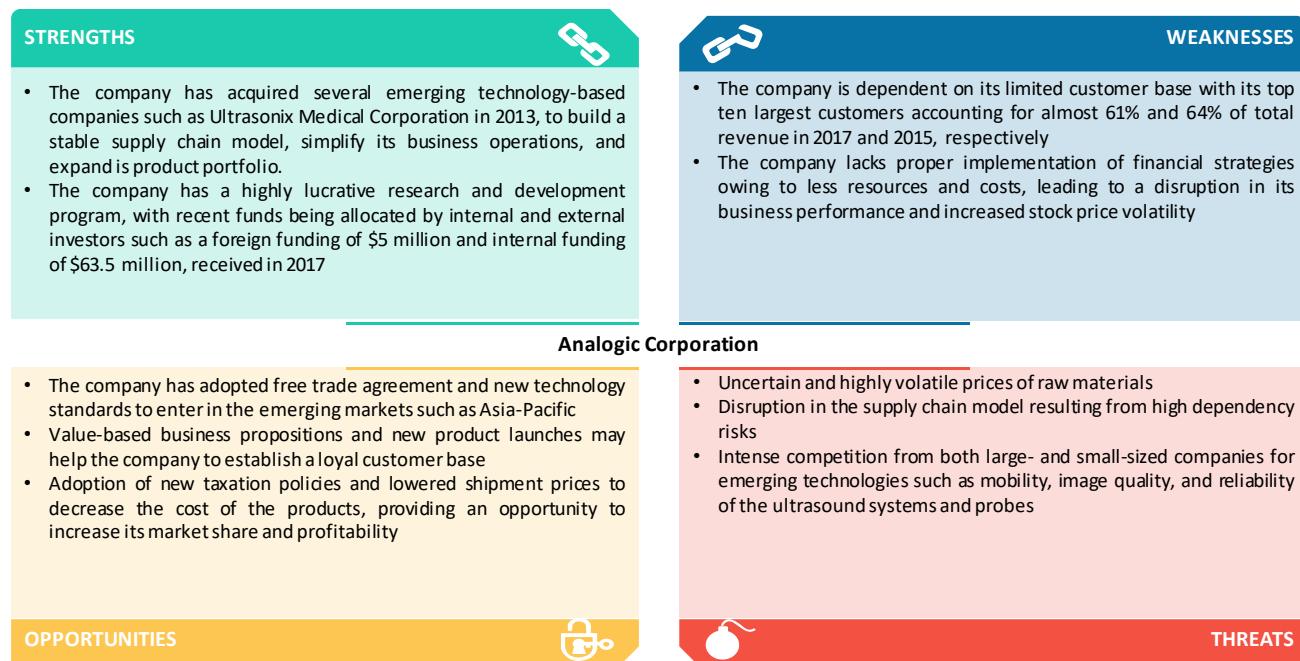
Figure: 8.5 Analogic Corporation - R&D Expenditure, 2015-2017

Source: *Analogic Corporation Website and BIS Research Analysis*

Analogic Corporation invests significantly in its research and development (R&D) activities with reported expenses of \$68.5 million in FY2017, \$72.3 million in FY2016, and \$76.3 million in FY2015. The company invested 5.2% less in research and development in FY2017 activities as compared to that of FY2016. Research is conducted for the development of the new products with new and advanced technologies.

8.2.4 SWOT Analysis

Figure: 8.6 SWOT Analysis - Analogic Corporation



Source: BIS Research Analysis



8.3 Canon Inc.

8.3.1 Company Overview

Particular	Specifications (as of FY2017)
Website	www.canon.com
Headquarters	Tokyo, Japan
Year of Establishment	1937
Ownership Type	Public
Net Revenue	\$36,393.7 Million
Number of Employees	1,97,776
Subsidiaries	Canon Australia Pty. Ltd., Canon India Pvt. Ltd., Canon Middle East FZ-LLC, Canon Singapore Pte. Ltd., and Canon Nederland N.V. (Netherlands), among others

Source: *Canon Inc. Website and BIS Research Analysis*

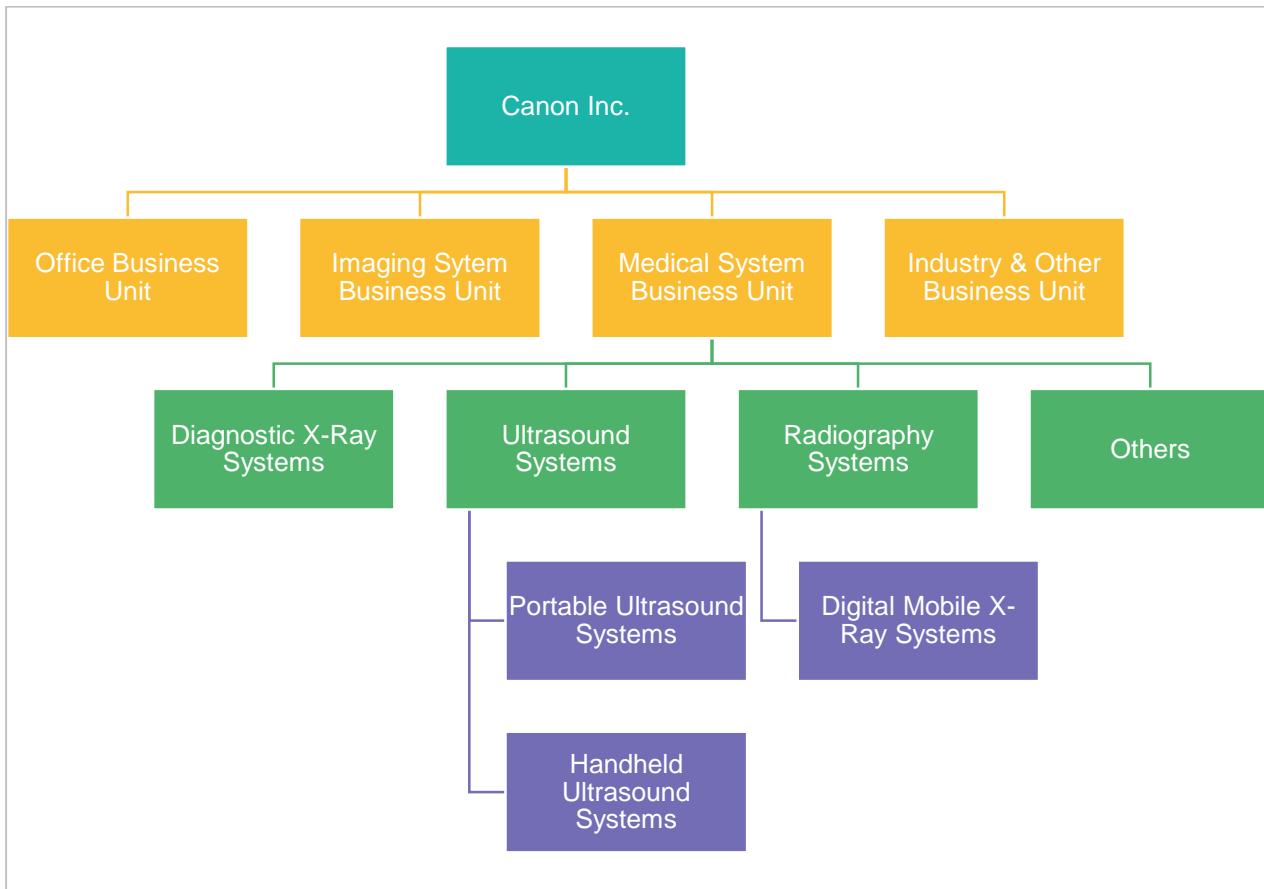
8.3.2 Role of Canon Inc. in the Portable Imaging Solutions Market

Canon Inc. offers products and services for office businesses such as laser printers, wide-format printers, digital production printing systems, and document solutions; imaging systems business such as inkjet printers, compact photo printers, image scanners, and digital cinema cameras; medical systems businesses such as diagnostic X-ray systems, computed tomography, diagnostic ultrasound systems, digital radiography systems, and magnetic resonance imaging systems; and industry & other businesses such as network cameras, micromotors, die bonders, document scanners, and handy terminals.

Catering to the portable imaging solutions market, the company offers portable and handheld ultrasound systems and digital mobile X-ray systems. Canon Inc. accounted for an estimated 6.44% share of the global market value in 2017. This is attributed to the company's global presence in China, Japan, Korea, Malaysia, Singapore, France, Belgium, Germany, Italy, the Netherlands, Spain, Sweden, Switzerland, Canada, the U.S., and the U.K., among others.

Some of the leading competitors of the company contributing significantly to the portable imaging solutions market are Fujifilm Holdings Corporation, General Electric Company, and Samsung Electronics Co, Ltd., Analogic Corporation, Hitachi, Ltd., and Konica Minolta, Inc.

Figure: 8.7 Canon Inc. - Product Portfolio for Portable Imaging Solutions Market



Source: Canon Inc. Website and BIS Research Analysis

The company incorporates product launches as its key strategy to expand its product portfolio in the portable imaging solutions market. The significant product launches made by the company are:

- In March 2018, the company launched Viamo sv7 handheld ultrasound system at European Congress of Radiology 2018, Austria.
- In July 2016, the company launched RadPRO 1 Mobile 40kW FLEX PLUS mobile digital X-ray system. The system offers customization workflow with elimination of unnecessary steps from the procedure.

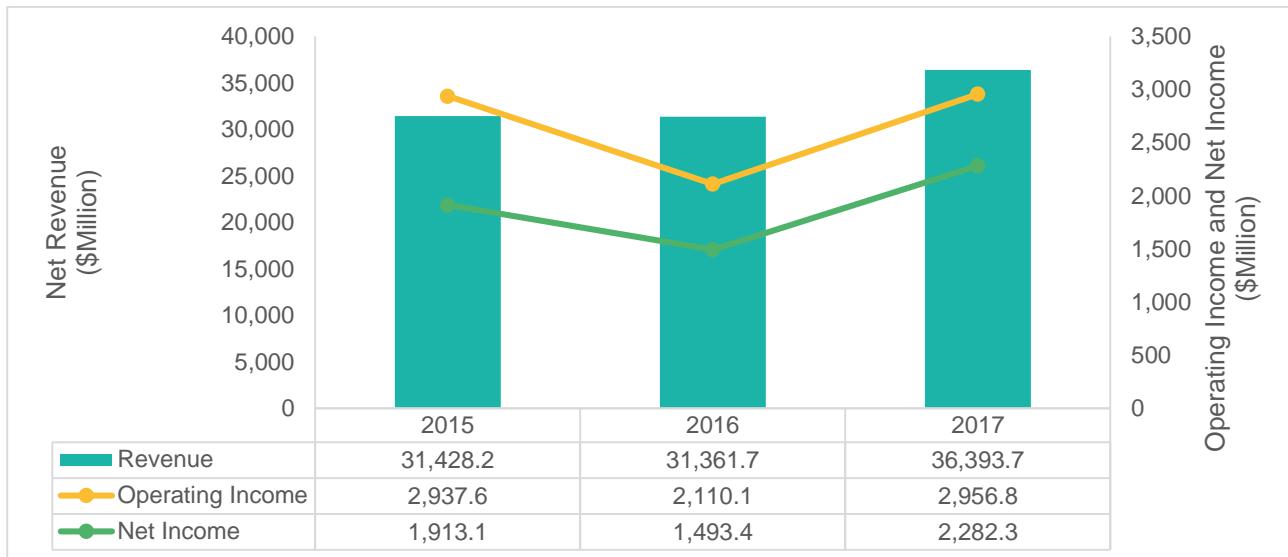


BIS Research

Global Portable Imaging Solutions Market

8.3.3 Financials

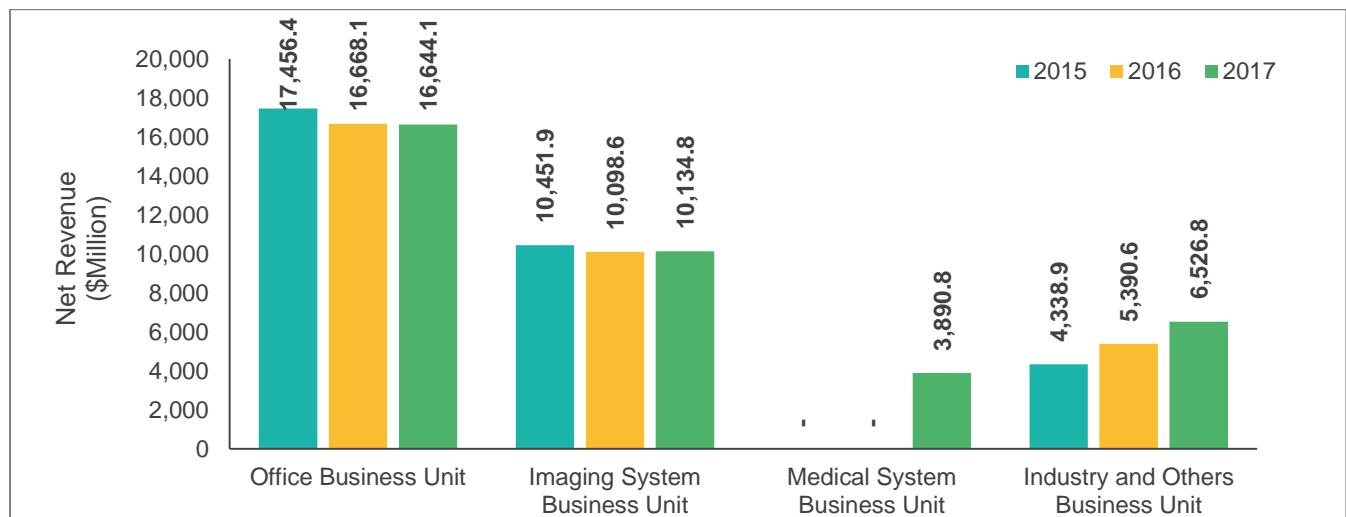
Figure: 8.8 Canon Inc. - Overall Financials, 2015-2017



Source: Canon Inc. Website and BIS Research Analysis

The financial year (FY) of the company starts from 1st January and ends on 31th December. The company generated a net revenue of \$36,393.7 million for the FY2017. The company reported a net increase of \$5,032.0 million or 16.05% in its revenue in FY2017 from FY2016, driven primarily by increased sales of recently launched products along with the acquisition of Toshiba Medical Systems (TMSC).

Figure: 8.9 Canon Inc. - Revenue (by Segment), 2015-2017

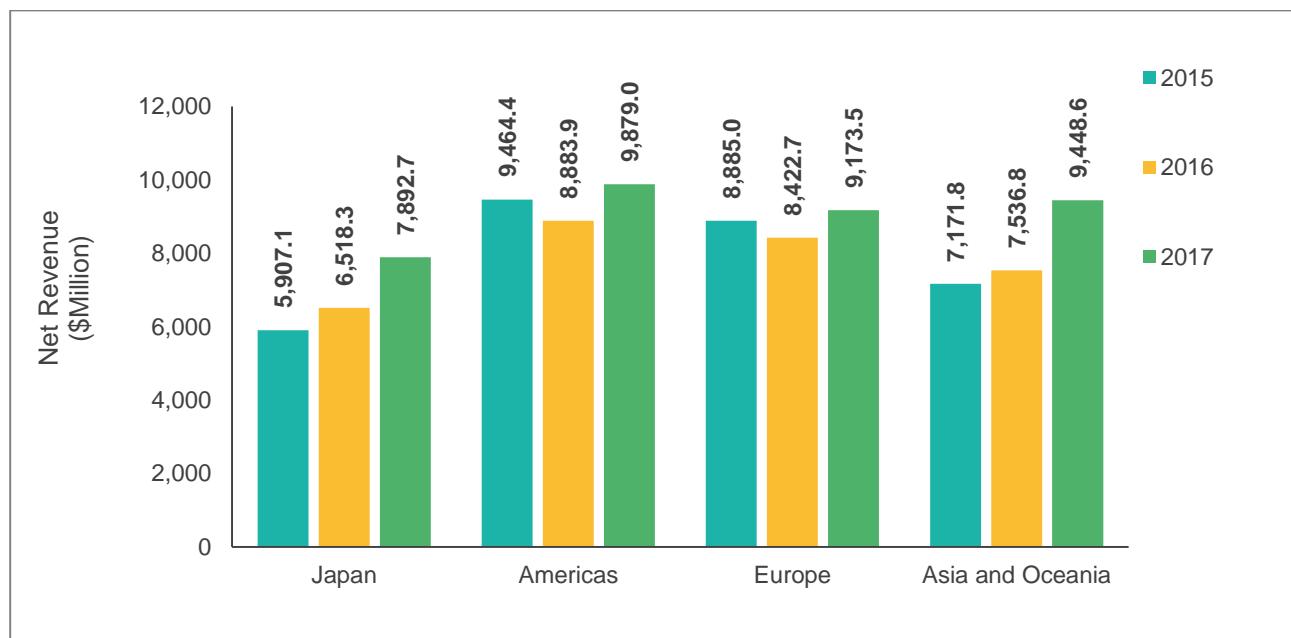


Source: Canon Inc. Website and BIS Research Analysis

The company reports its operations under four reportable segments, namely, Office Business Unit, Imaging Systems Business Unit, Medical Systems Business Unit, and Industry & Others Business Unit.

The Office Business Unit generated a net revenue of \$16,644.1 million in FY2017, reporting a decline of 0.14% when compared with that of FY2016, owing to the fluctuation in exchange currency rates. Imaging Systems Business Unit generated a net revenue of \$10,134.8 million in FY2017, reporting a rise of 0.36% when compared with that of FY2016. The sales of the products under this segment were flat year-on-year. The company entered in the healthcare market through the acquisition of Toshiba Medical Systems (TMSC) in 2016 and generated a net revenue of \$3,890.8 million in FY2017. Industry & Others Business Unit generated a net revenue of \$6,526.8 million in FY2017, reporting a rise of 21.08% when compared with that of FY2016.

Figure: 8.10 Canon Inc. - Revenue (by Region), 2015-2017

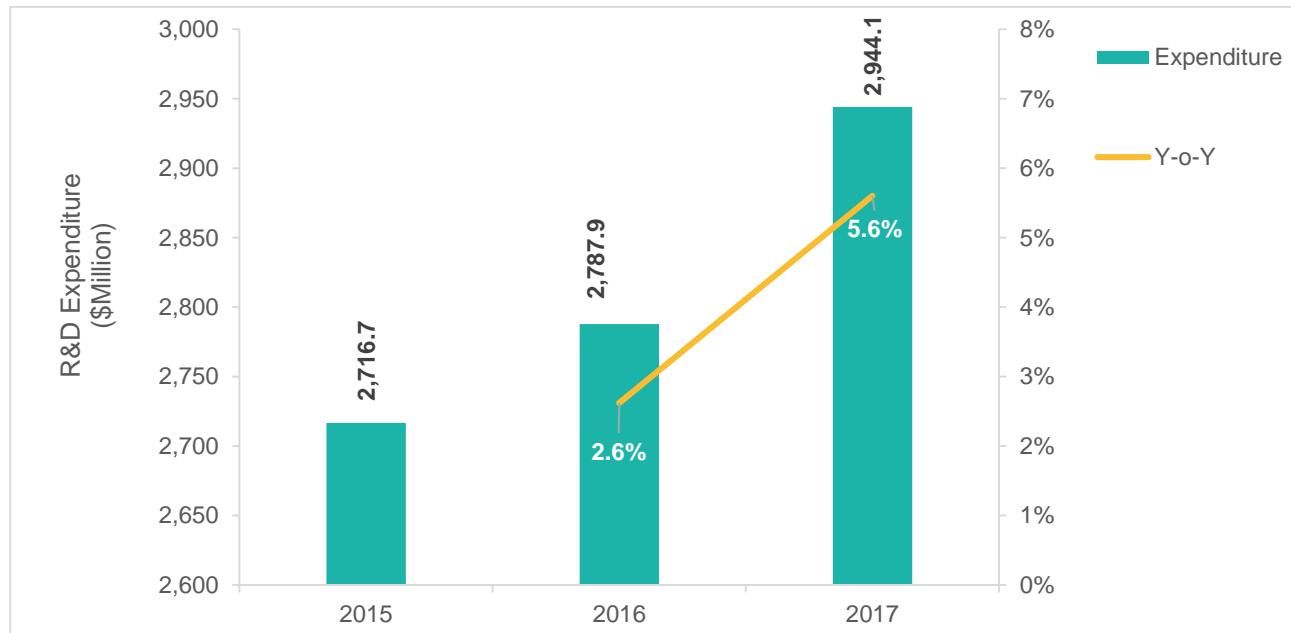


Source: Canon Inc. Website and BIS Research Analysis

The company reports its regional operations in four segments, namely, Japan, Americas, Europe, and Asia & Oceania. Japan generated a revenue of \$7,892.7 million, reporting a rise of 21.08% from that of FY2016, driven by acquisition of Toshiba Medical Systems Corporation (TMSC). Americas generated a revenue of \$9,879.0 million in FY2017, reporting a rise of 11.20%, driven by increased sales of network cameras and favorable currency exchange rates.

Europe generated a revenue of \$9,173.5 million in FY2017, reporting a rise of 8.91%, owing to the increased sales of network cameras and favorable currency exchange rates. Asia & Oceania generated a revenue of \$9,448.6 million in FY2017, reporting a rise of 25.37%, mainly driven by increased sales of manufacturing equipment for OLED displays.

Figure: 8.11 Canon Inc. - R&D Expenditure, 2015-2017



Source: Canon Inc. Website and BIS Research Analysis

Canon Inc. invests significantly in its research and development (R&D) with reported expenses of \$2,944.1 million in FY2017, \$2,787.9 million in FY2016, and \$2,716.7 million in FY2015. Research is conducted for the development of the new products with new and advanced technologies.

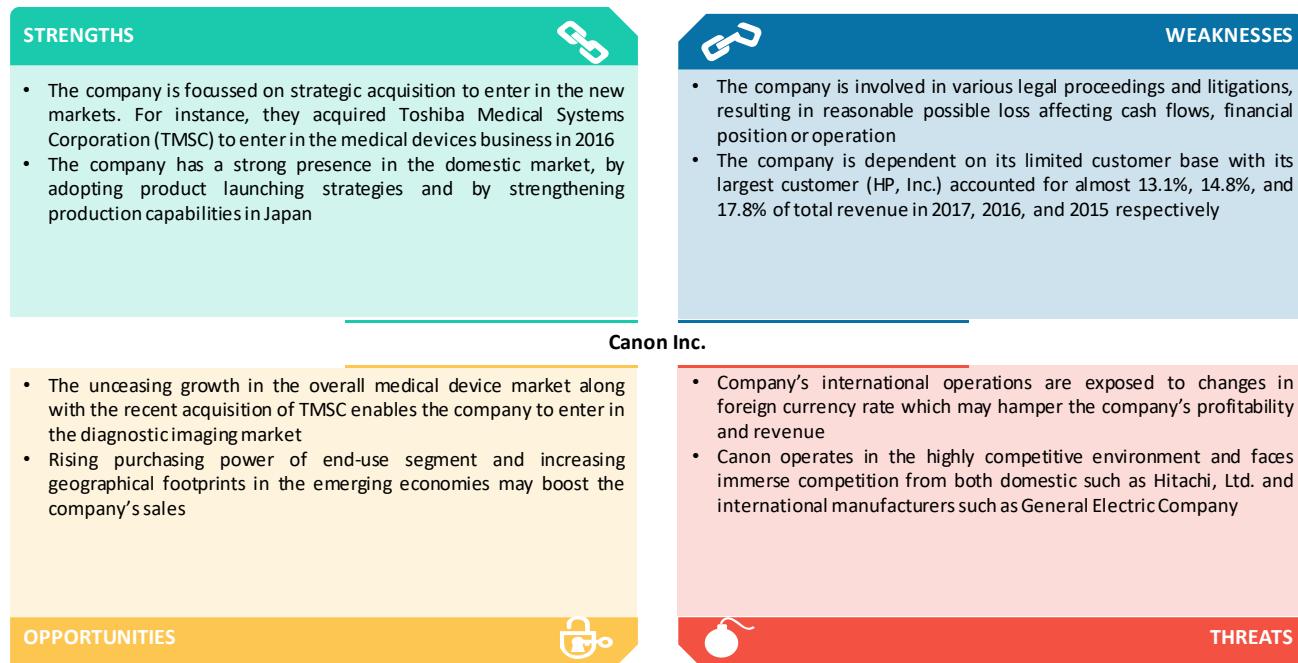


BIS Research

Global Portable Imaging Solutions Market

8.3.4 SWOT Analysis

Figure: 8.12 SWOT Analysis - Canon Inc.



Source: BIS Research Analysis

8.4 Fujifilm Holdings Corporation

8.4.1 Company Overview

Particular	Specifications (as of FY2017)
Website	www.fujifilm.com
Headquarters	Tokyo, Japan
Year of Establishment	1934
Ownership Type	Public
Net Revenue	\$18,760.5 Million
Number of Employees	77,739
Subsidiaries	SonoSite, Inc. (U.S.), Fujifilm Imaging Systems Co., Ltd. (Japan), Fujifilm Europe GmbH (Germany), and Fujicolor Benelux B.V. (Netherlands), among others

Source: *Fujifilm Holdings Corporation Website and BIS Research Analysis*

8.4.2 Role of Fujifilm Holdings Corporation in the Portable Imaging Solutions Market

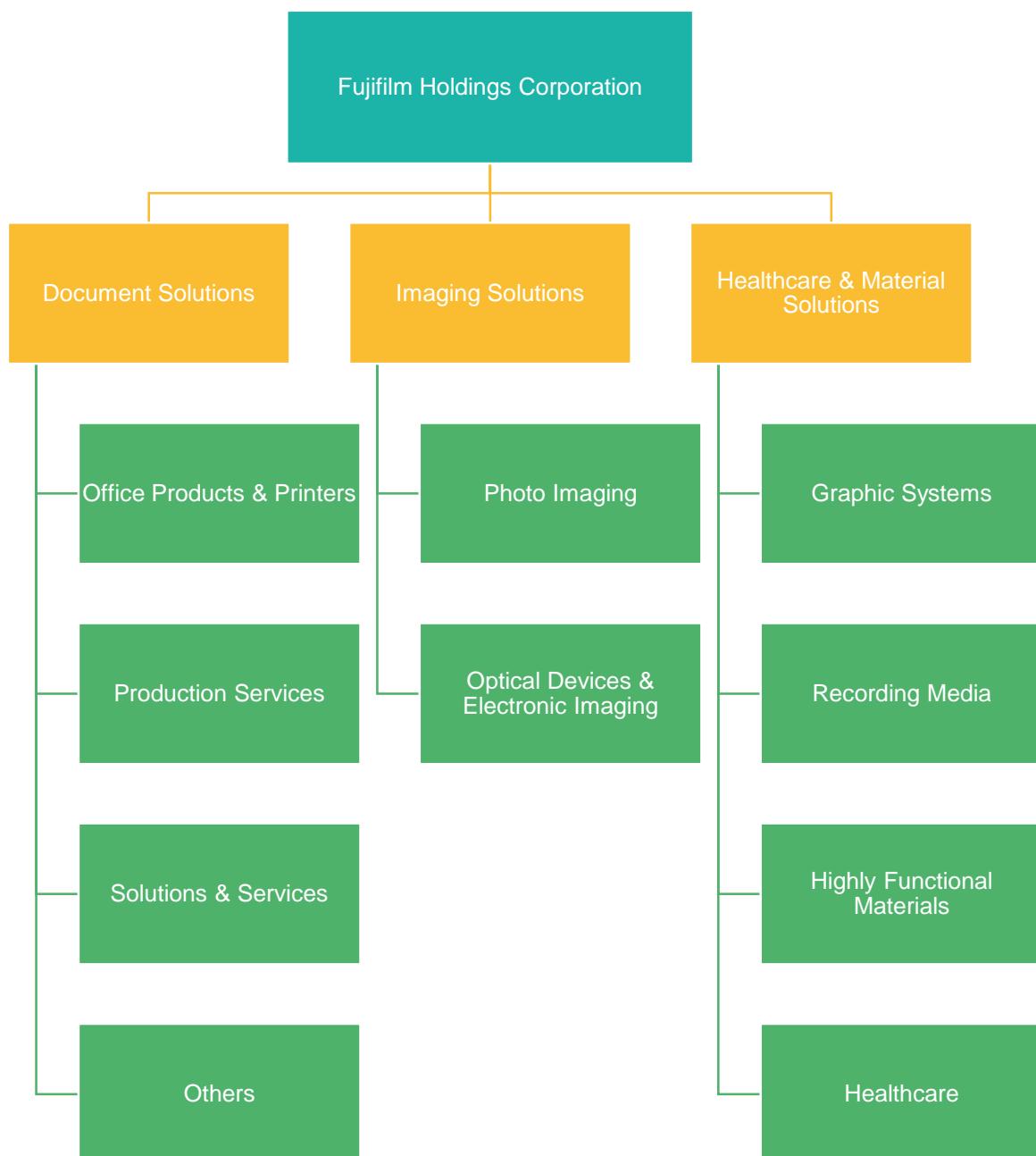
Fujifilm Holdings Corporation offers products and services for document solutions, healthcare & material solutions, and imaging solutions. Its document solutions business offers office products & printers, production services, and solutions & services. The healthcare & material business offers healthcare products, highly functional materials, graphics systems, and recording media. The imaging solutions business offers photo imaging solutions, optical devices, and electronic imaging products.

Catering to the portable imaging solutions market, the company offers portable and handheld ultrasound systems and digital mobile X-ray systems. Fujifilm Holdings Corporation accounted for an estimated 7.15% share of the global market value in 2017. The company is focused on advanced image processing technologies to provide optimal images for efficient diagnosis, thus significantly strengthening the company's position in the market.

The company conducts its operations through the diverse network of subsidiaries. As of 2018, Fujifilm has 283 subsidiaries in total, i.e. 2 in Middle East & Africa, 46 in Europe, 31 in North America, 4 in Latin America, 103 in Asia & Oceania (except Japan), and 97 in Japan.

Some of the leading competitors of the company contributing significantly to the portable imaging solutions market are Analogic Corporation, Canon Inc., General Electric Company, and Samsung Electronics Co, Ltd., Hitachi, Ltd., Konica Minolta, Inc.

Figure: 8.13 Fujifilm Holdings Corporation - Product Portfolio for Portable Imaging Solutions Market



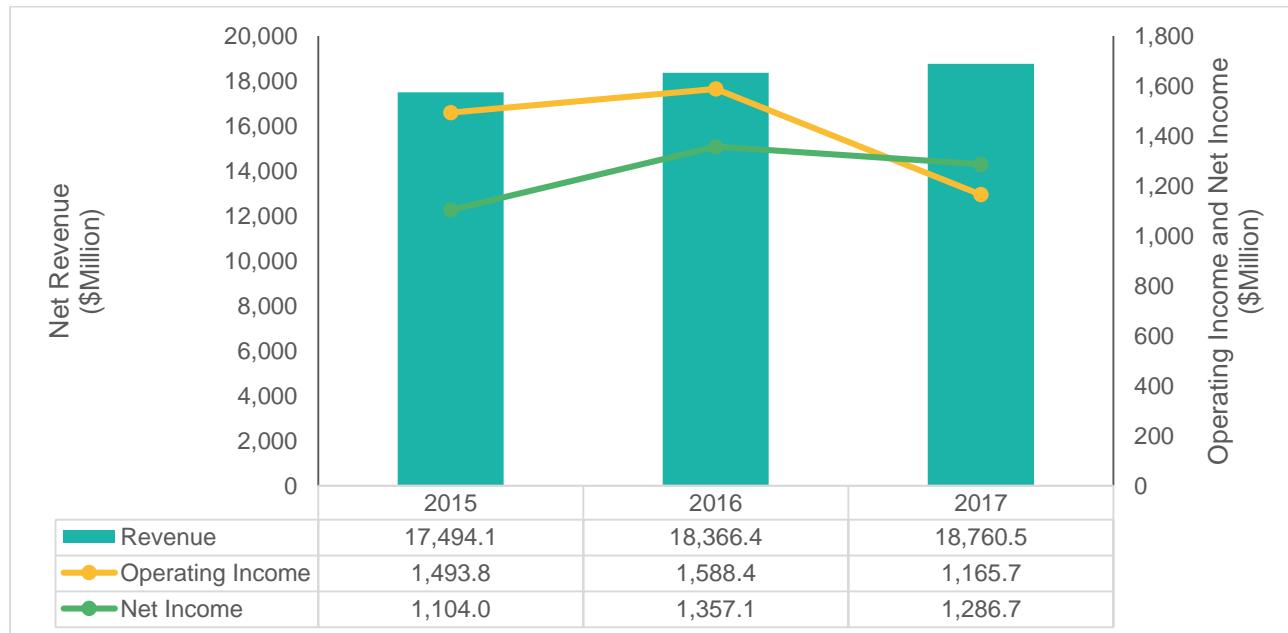
Source: Fujifilm Holdings Corporation Website and BIS Research Analysis

The company incorporates product launches as its key strategy to expand its product portfolio in the portable imaging solutions market. The significant product launches made by the company are:

- In November 2017, the company launched FDR Go PLUS version, a digital portable X-ray system offering a compact and quiet design along with kid-friendly graphics to calm the patients.
- In November 2017, the company launched X-Porte portable ultrasound system. The system is equipped with proprietary beam-forming technology XDI (Extreme Definition Imaging) to enhance image quality.
- In November 2016, the company launched FDR AQRO, a portable X-ray system. The product is equipped with company's dose –saving technologies and offers high maneuverability.

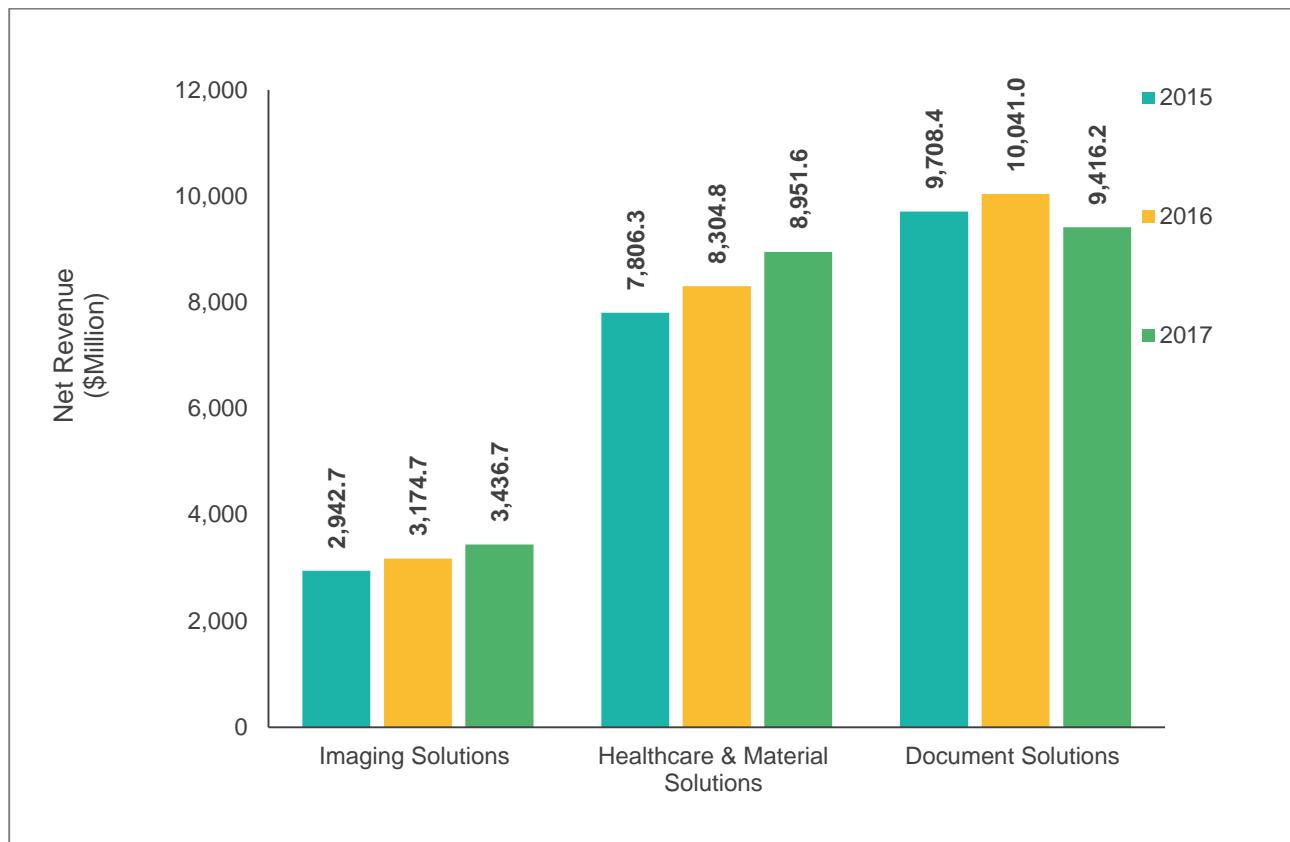
8.4.3 Financials

Figure: 8.14 Fujifilm Holdings Corporation - Overall Financials, 2015-2017



Source: Fujifilm Holdings Corporation Website and BIS Research Analysis

The financial year (FY) of the company starts from 1st April and ends on 31th March. The company generated a net revenue of \$18,760.5 million for the FY2017. The company reported a net increase of \$394.1 million or 2.15% in its revenue in FY2017 from FY2016, driven primarily by strong sales growth in electric imaging field of optical devices and electronic imaging segment, electronic imaging business, and medical systems business.

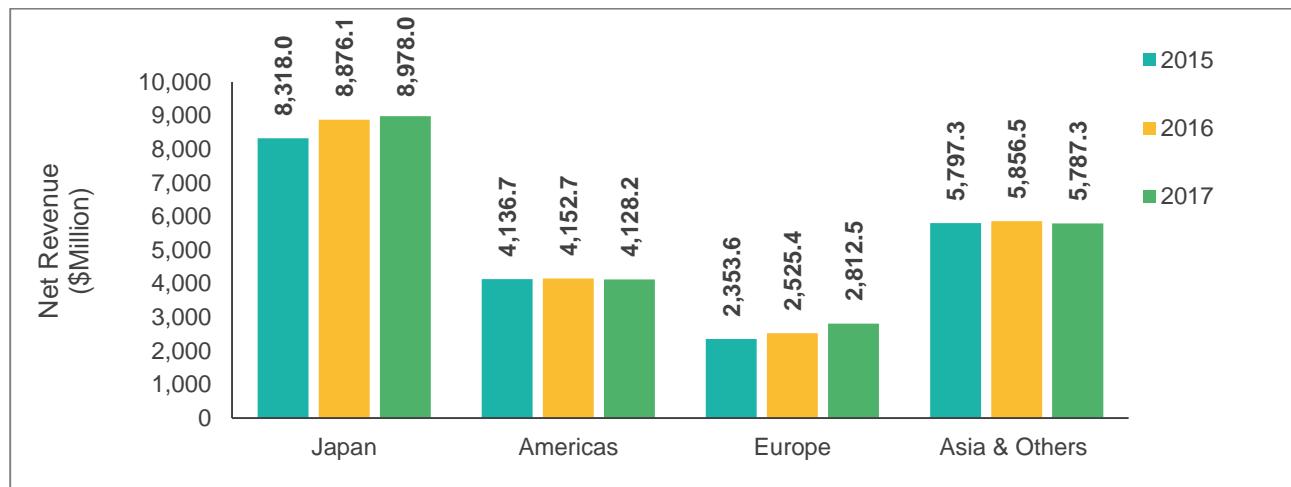
Figure: 8.15 Fujifilm Holdings Corporation - Revenue (by Segment), 2015-2017


Source: Fujifilm Holdings Corporation Website and BIS Research Analysis

The company reports its operations under three reportable segments, namely, Imaging Solutions, Healthcare & Material Solutions, and Document Solutions. The Imaging Solutions segment generated a revenue of \$3,436.7 million in FY2017, reporting a rise of 8.25% when compared with that of FY2016, primarily driven by increased sales in electronic imaging field of optical devices and electronic imaging business.

The Healthcare & Material Solutions segment generated a revenue of \$8,951.6 million in FY2017, reporting a rise of 7.79% when compared with that of FY2016, primarily driven by increased sales in medical devices business and electronic materials business.

The Document Solutions segment generated a revenue of \$9,416.2 million in FY2017, reporting a decline of 6.22% when compared with that of FY2016, owing to the low profitability in office printer business and decreased operating income in this segment.

Figure: 8.16 Fujifilm Holdings Corporation - Revenue (by Region), 2015-2017


Source: Fujifilm Holdings Corporation Website and BIS Research Analysis

The company reports its regional operations in four segments, namely, Japan, Americas, Europe, and Asia & Others. The company generated 41.36% of its revenue for FY2017 from the Japan alone. As of FY2017, Japan generated a revenue of \$8,978.0 million, reporting a rise of 1.15% from that of FY2016. Americas generated a revenue of \$4,128.2 million in FY2017, reporting a decline of 0.59% from that of FY2016. The Europe generated a revenue of \$2,812.5 million in FY2017. The Asia & Others generated a revenue of \$5,787.3 million in FY2017, reporting a decline of 1.18% from that of FY2016.

Figure: 8.17 Fujifilm Holdings Corporation - R&D Expenditure, 2015-2017

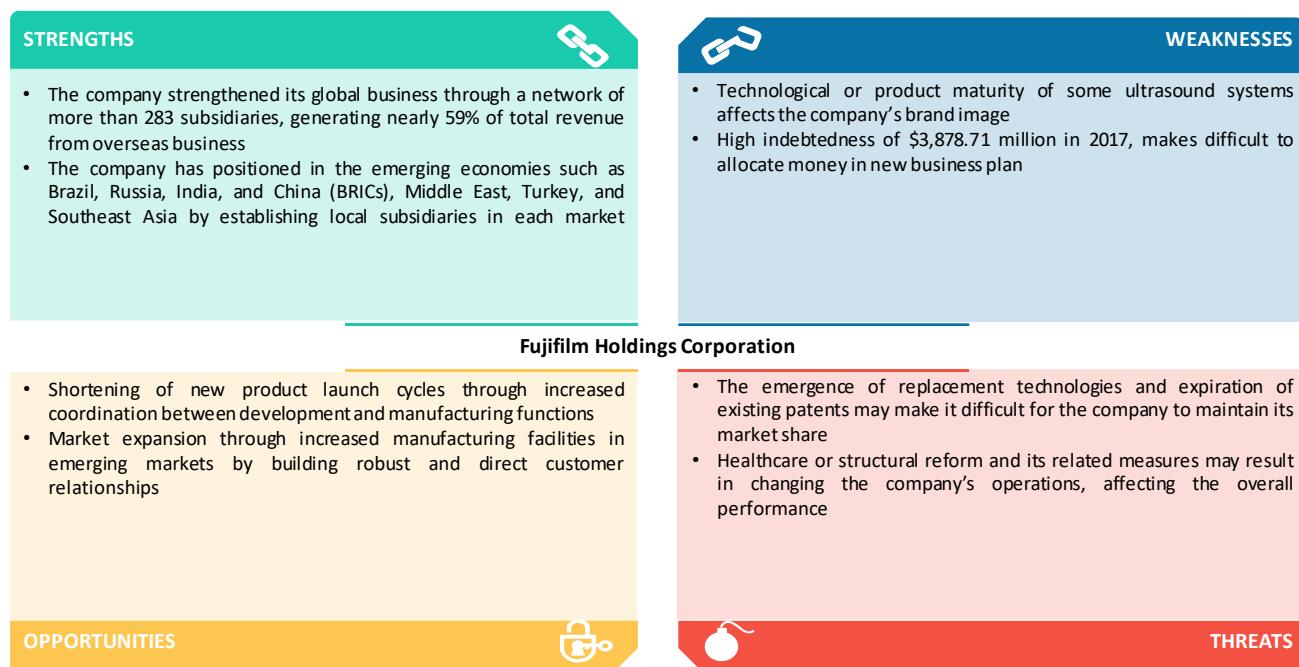

Source: Fujifilm Holdings Corporation Website and BIS Research Analysis



Fujifilm Holdings Corporation invests significantly in its research and development (R&D) with reported expenses of \$1,483.4 million in FY2017, \$1,502.9 million in FY2016, and \$1,324.9 million in FY2015. Research is conducted for the development of the new products using new technologies in all the business segments.

8.4.4 SWOT Analysis

Figure: 8.18 SWOT Analysis - Fujifilm Holdings Corporation



Source: BIS Research Analysis



8.5 General Electric Company

8.5.1 Company Overview

Particular	Specifications (as of FY2017)
Website	www.ge.com
Headquarters	Massachusetts, U.S.
Year of Establishment	1892
Ownership Type	Public
Net Revenue	\$122,100.0 million
Number of Employees	313,000
Subsidiaries	GE Healthcare (The U.S.), GE Healthcare Dharmacon, Inc. (The U.S.), GE Healthcare BV (The Netherlands), and GE Healthcare Bio-Sciences Corp. (The U.S.), among others

Source: General Electric Company Website and BIS Research Analysis

8.5.2 Role of General Electric Company in the Portable Imaging Solutions Market

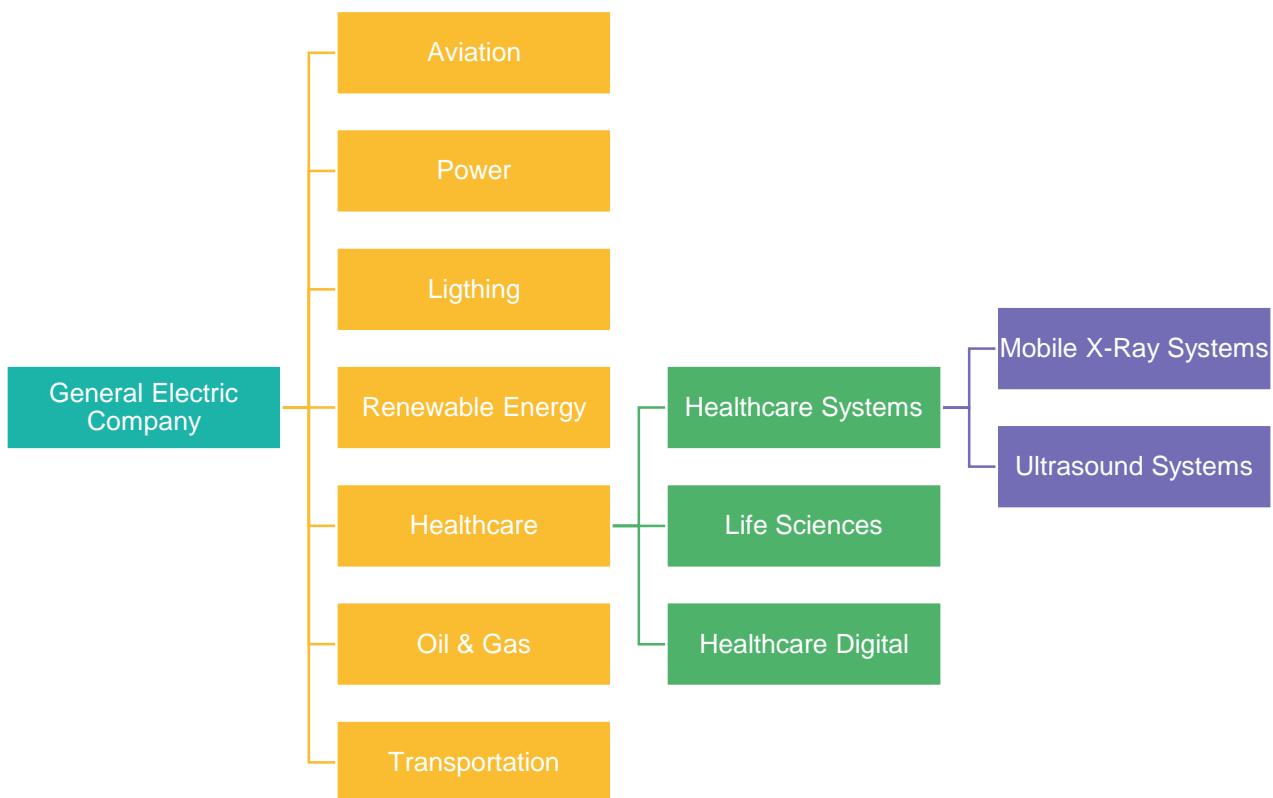
General Electric Company is engaged in developing, manufacturing, and marketing of the diverse range of products ranging from power generation, aircraft engines to medical imaging technologies and gas production equipment. The company operates through seven reportable segments including Aviation, Power, Lighting, Renewable Energy, Healthcare, Oil & Gas, and Transportation.

Its Healthcare segment offers products and services for hospitals, medical facilities, pharmaceutical, and biotechnology companies. Company's Healthcare business is segmented into Healthcare Systems, Life Sciences, and Healthcare Digital.

Pertaining to the portable imaging solutions market, General Electric Company offers ultrasound systems and mobile X-ray systems. Company accounted for an estimated 20.70% share in the global market value in 2017. The market dominance is attributed to the diverse range of product offerings in the portable imaging solutions market and a strong regional presence in more than 180 countries.

Some of the leading competitors of the company contributing significantly to the portable imaging solutions market are Koninklijke Philips N.V., Canon Inc., Fujifilm Holdings Corporation, Konica Minolta Inc., Hitachi, Ltd., and Siemens Healthineers, Inc.

Figure: 8.19 General Electric Company - Product Portfolio for Portable Imaging Solutions Market



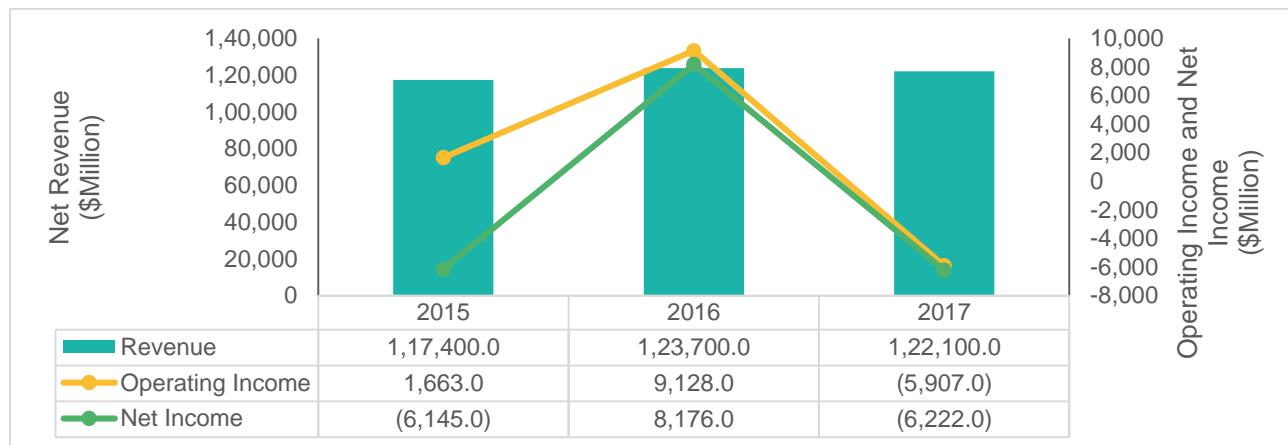
Source: General Electric Company Website and BIS Research Analysis

The company incorporates product launches as its key strategy to expand its product portfolio in the portable imaging solutions market. The significant product launches made by the company are

- Vscan Extend Handheld Ultrasound System in 2017. The company launched Vscan Extend dual-probe handheld ultrasound system. The system offers wireless connectivity with enhanced image quality for use both inside and outside hospitals.
- Vivid IQ Portable Ultrasound System in 2016. The company launched Vivid IQ cardiovascular portable ultrasound system. The system weighs less than 4.5 kgs. and offers high image quality and intuitive touchscreen features.

8.5.3 Financials

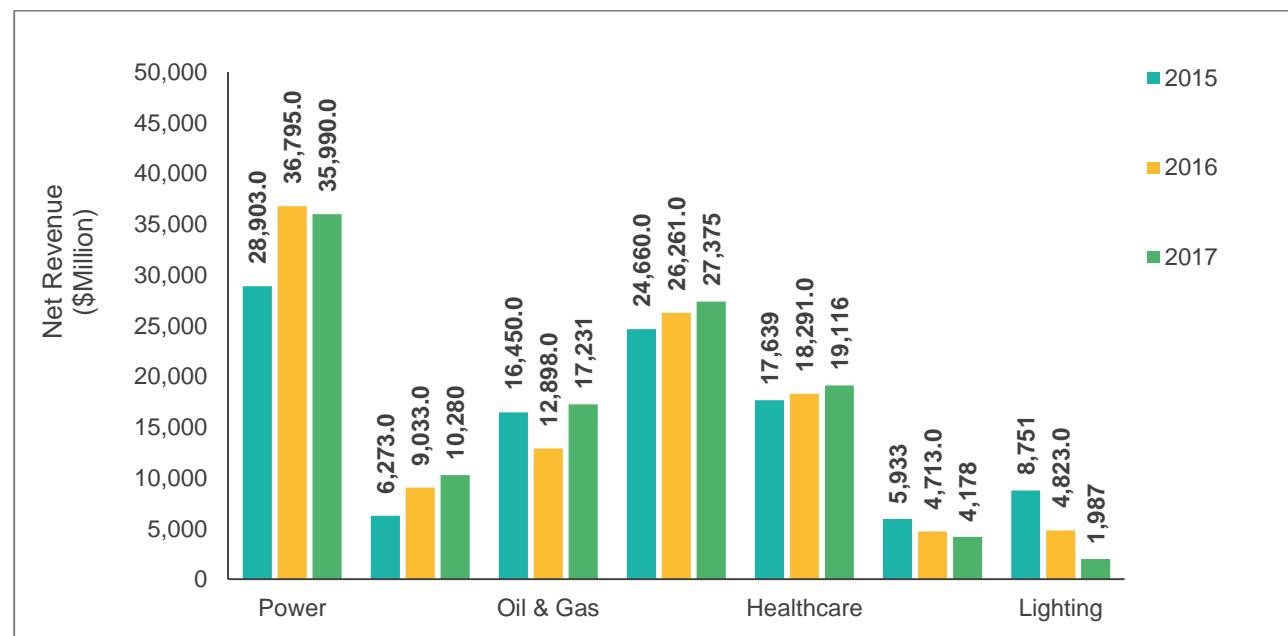
Figure: 8.20 General Electric Company - Overall Financials, 2015-2017



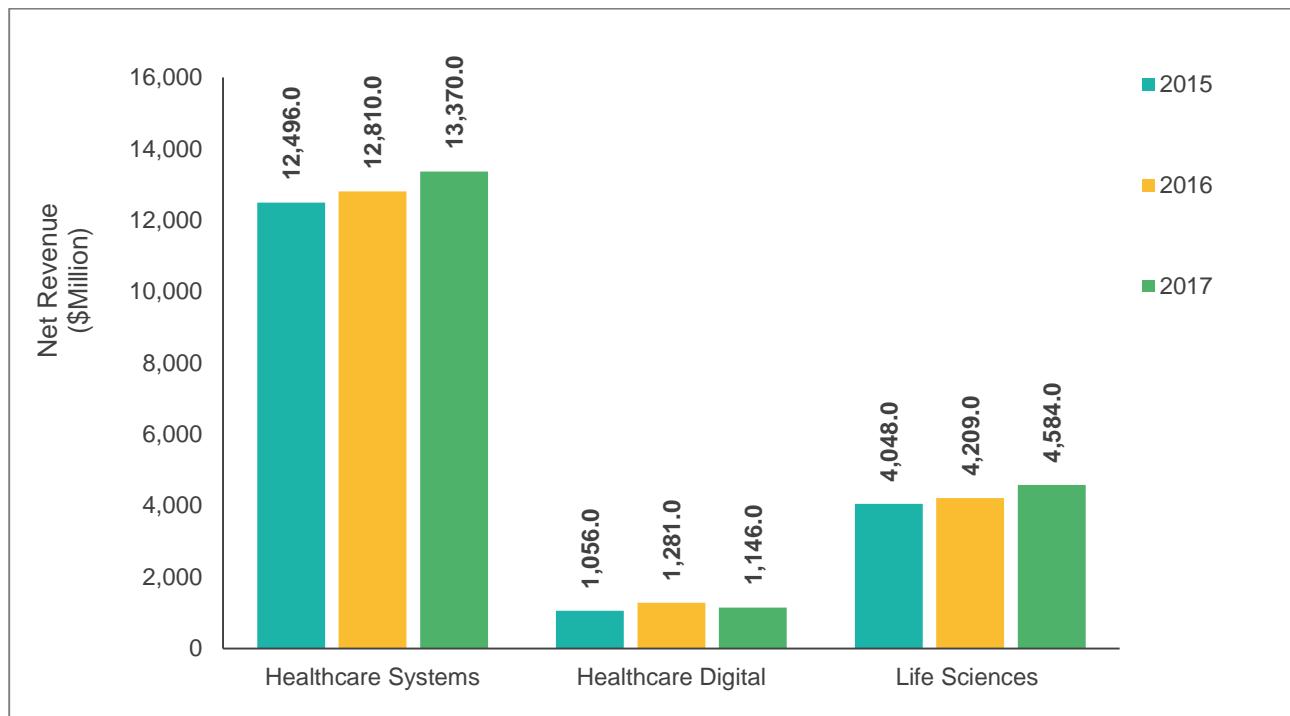
Source: General Electric Company Website and BIS Research Analysis

The financial year (FY) of the company starts from 1st January and ends on 31th December. The company generated a net revenue of \$1,22,100.0 million for the FY2017. The company reported a decrease of \$1,600 million in its revenue in FY2017 from FY2016, driven primarily by the decreased revenue of \$1,800 million in Financial Services and \$3,100 million in Corporate Services.

Figure: 8.21 General Electric Company - Revenue (by Segment), 2015-2017



Source: General Electric Company Website and BIS Research Analysis

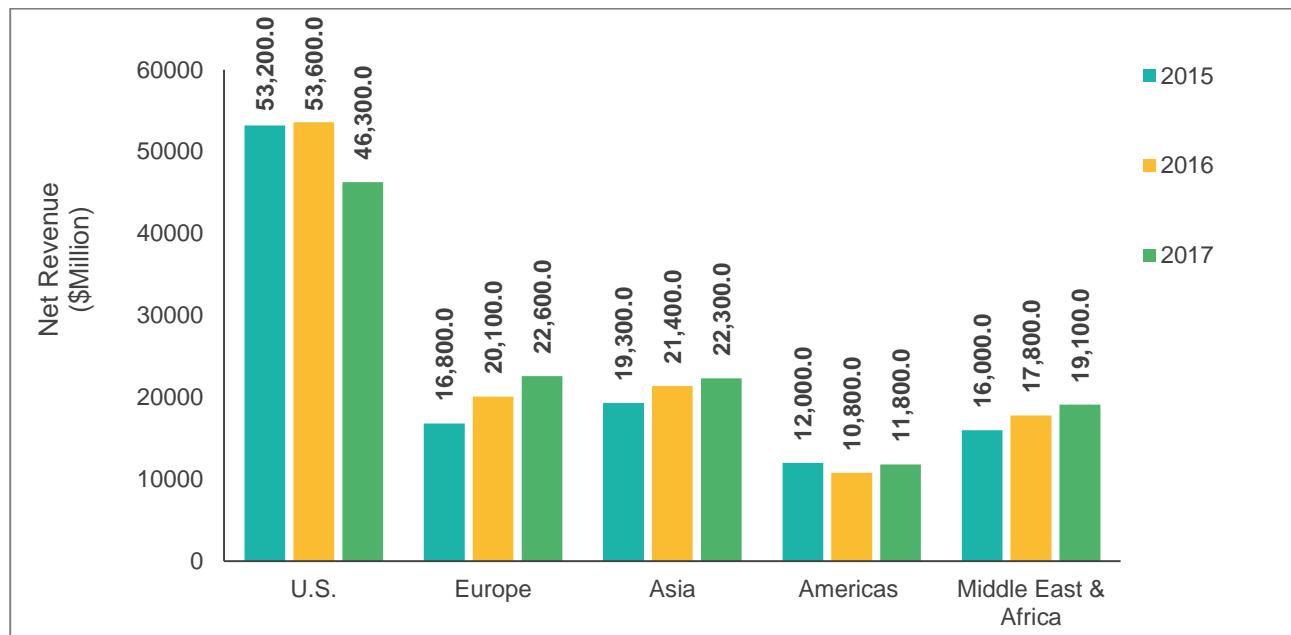
Figure: 8.22 General Electric Company (GE Healthcare) - Revenue (by Segment), 2015-2017


Source: General Electric Company Website and BIS Research Analysis

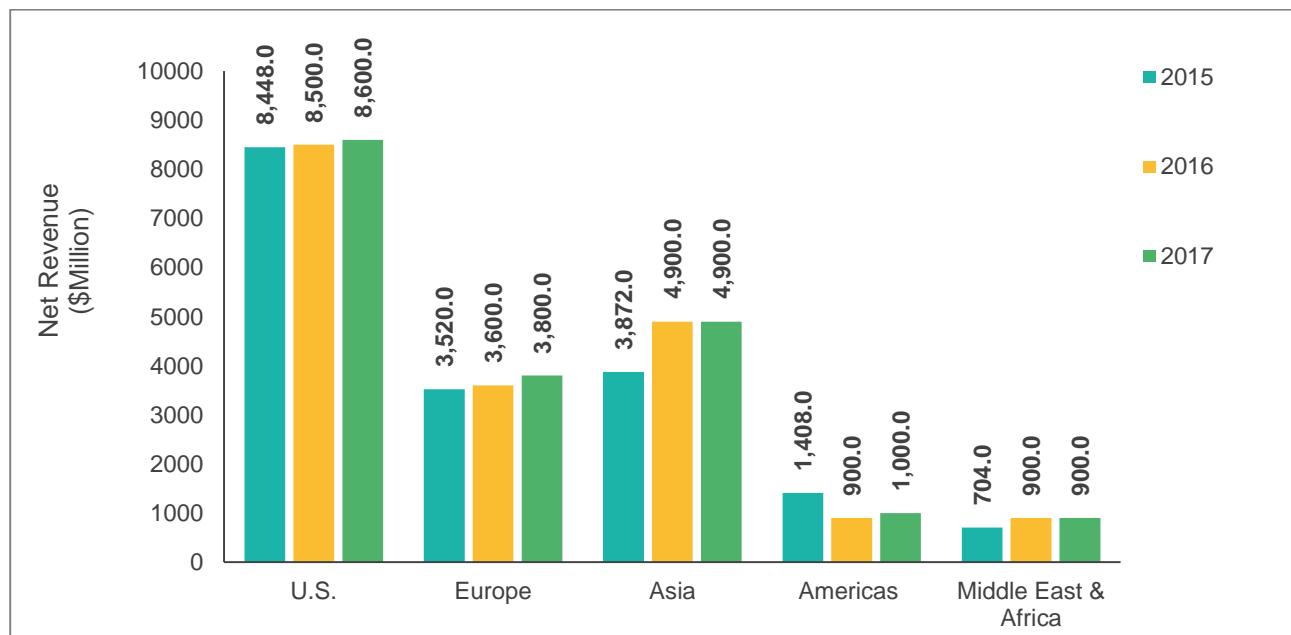
The company reports its operations under seven segments: Aviation, Power, Lighting, Renewable Energy, Healthcare, Oil & Gas, and Transportation. The Healthcare segment generated a revenue of \$19,116.0 million in FY2017, reporting an increase of 4.5% when compared with that of FY2016. This increase was primarily attributable to the strong sales in ultrasound segment as well as other diagnostic imaging modalities supported by strong market growth in emerging nations such as China.

The Power segment generated a revenue of \$35,990.0 million in FY2017, the Aviation segment generated a revenue of \$27,375.0 million in FY2017, the Renewable segment generated a revenue of \$10,280.0 million in FY2017, the Oil & Gas segment generated a revenue of \$17,231.0 million in FY2017, the Transportation segment generated a revenue of \$4,178.0 million in FY2017, and the Lighting segment generated a revenue of \$1,987.0 million in FY2017.

The healthcare segment is further divided into healthcare system, life sciences, and healthcare digital. The healthcare system segment is expected to expand its global market in China through ultrasound and imaging technology and life sciences segment through product launch, acquisitions, and organic investments.

Figure: 8.23 General Electric Company- Revenue (by Region), 2015-2017


Source: General Electric Company Website and BIS Research Analysis

Figure: 8.24 General Electric Company (GE Healthcare) - Revenue (by Region), 2015-2017


Source: General Electric Company Website and BIS Research Analysis

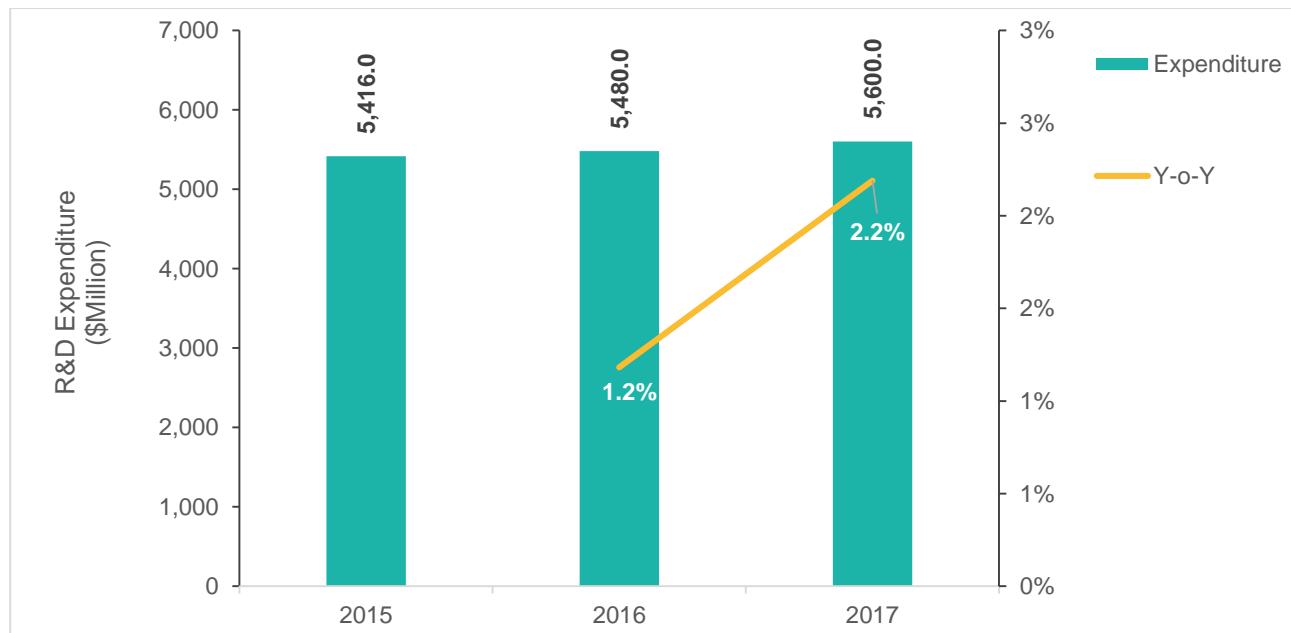
The company reports its regional operations in five segments, namely, U.S. Europe, Asia, Americas, and Middle East & Africa. The company generated 37.92% of its revenue for FY2017 from the U.S,

reporting a decrease of 15.76% from that of FY2016. This decrease was primarily attributed to the decline in the sales of Power, Renewable Energy, Transportation, and Lighting business segments.

As of FY2017, the non-U.S. regions generated a revenue of \$75,800.0 million, reporting a rise of 8.13% from that of FY2016. This increase was primarily attributed to the increases of 12% in Europe, 10% in Latin America, and 7% in the Middle East & Africa. The Americas region generated a revenue of \$11,800.0 million in FY2017, while the Asia region generated a revenue of \$23,300.0 million in FY2017.

The U.S. comprises 45.02% of sales in the healthcare segment. The healthcare segment witnessed an increase in sales in all the regions in the FY2017. The major net revenue of the healthcare segment generated was 55.49% of total net revenue in the non-U.S. regions (Europe, Asia, The Americas, and Middle East & Africa), due to 26 new product launches in the FY2017.

Figure: 8.25 General Electric Company - R&D Expenditure, 2015-2017

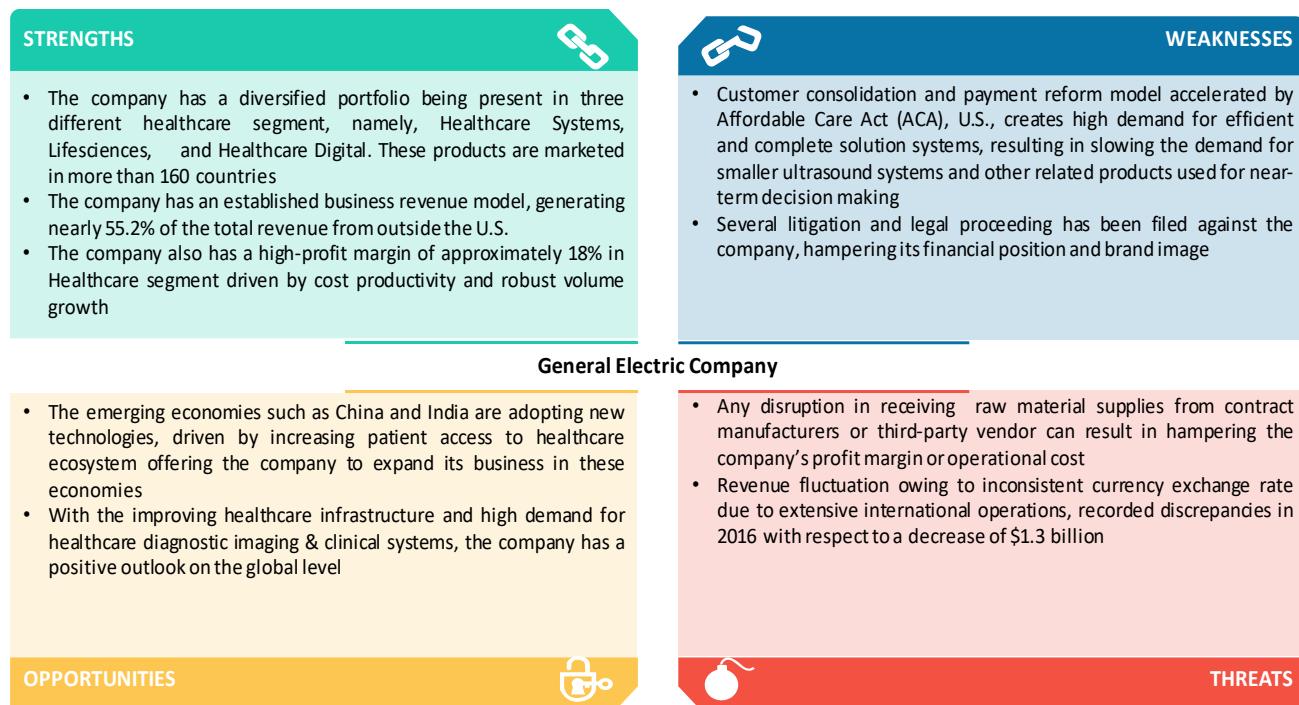


Source: General Electric Company Website and BIS Research Analysis

General Electric Company invests significantly in its research and development (R&D) with reported expenses of \$5,600.0 million in FY2017 and \$5,480.0 million in FY2015. The company heavily invested in its R&D activities for the development of the new products and broadening the applications for existing products.

8.5.4 SWOT Analysis

Figure: 8.26 SWOT Analysis - General Electric Company



Source: BIS Research Analysis



8.6 Hitachi, Ltd.

8.6.1 Company Overview

Particular	Specifications (as of FY2017)
Website	www.hitachi.com
Headquarters	Tokyo, Japan
Year of Establishment	1910
Ownership Type	Public
Net Revenue	\$83,567.9 Million
Number of Employees	307,275
Subsidiaries	Hitachi China Ltd., Hitachi Solutions, Ltd. (Tokyo), Hitachi America, Ltd. (U.S.), and Hitachi Medical Corporation (Japan), among others

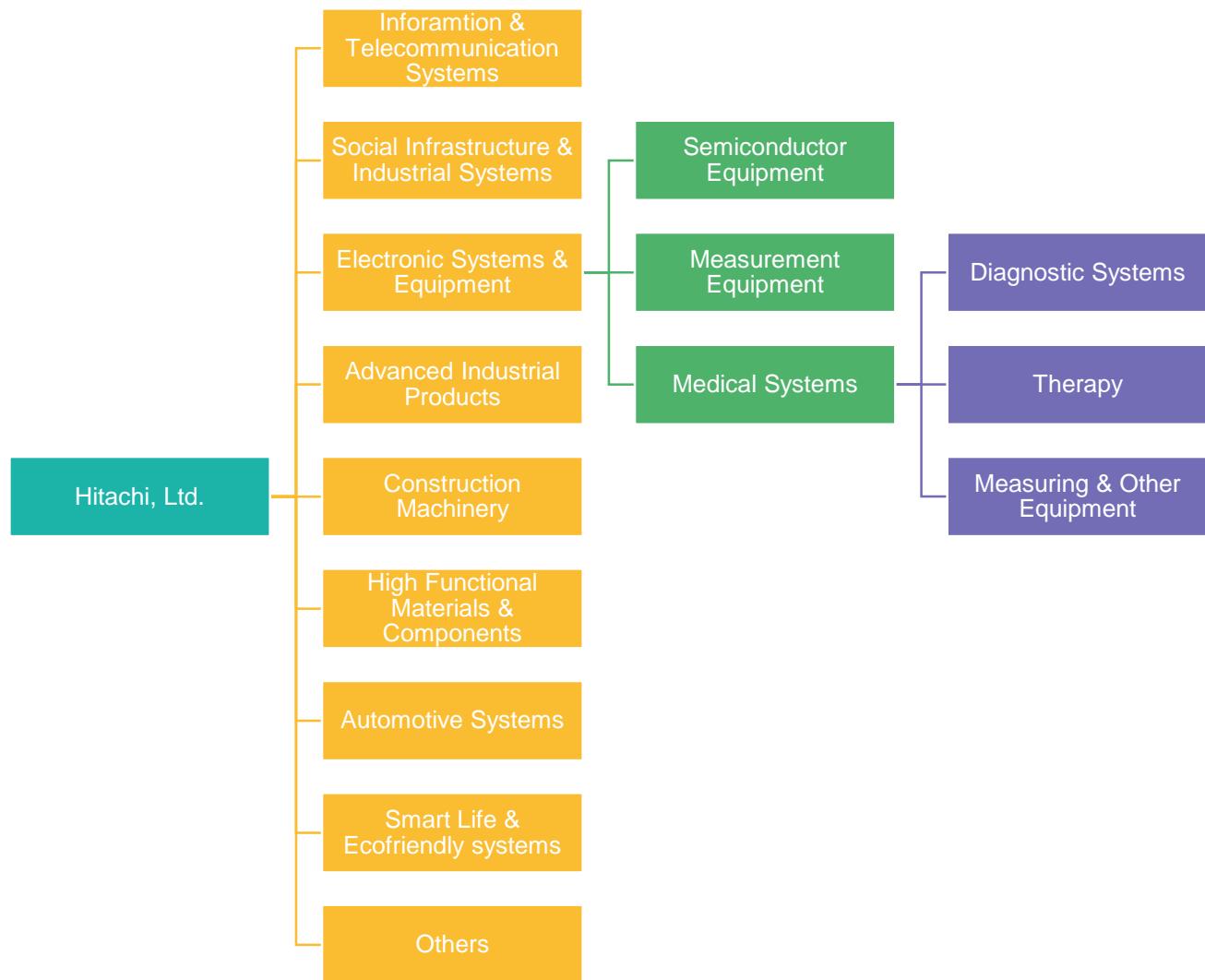
Source: Hitachi, Ltd. Website and BIS Research Analysis

8.6.2 Role of Hitachi, Ltd. in the Portable Imaging Solutions Market

The company offers a broad range of products and services in different markets. They provide social infrastructure and industrial products, information & telecommunication related systems, electronic systems and equipment, construction machinery, high functional materials and components such as semiconductors, synthetic resins, and magnetic materials, automotive systems, and eco-friendly systems.

The company offers diagnostic medical equipment such as MRI systems, ultrasound systems, bone densitometry systems, X-ray systems, and CT systems, and measuring instruments such as optical topography systems, sample preparation systems, and X-ray irradiation systems. Catering to the portable imaging solutions market, the company offers portable ultrasound systems and digital mobile X-ray systems. Hitachi, Ltd. accounted for an estimated share of 6.61% in the global market value in 2017. The company has business locations in more than 68 countries.

Some of the leading competitors of the company contributing significantly to the portable imaging solutions market include Canon Inc., Fujifilm Holdings Corporation, General Electric Company, Konica Minolta, Inc., and Koninklijke Philips N.V., among others.

**Figure: 8.27 Hitachi, Ltd. - Product Portfolio for Portable Imaging Solutions Market**

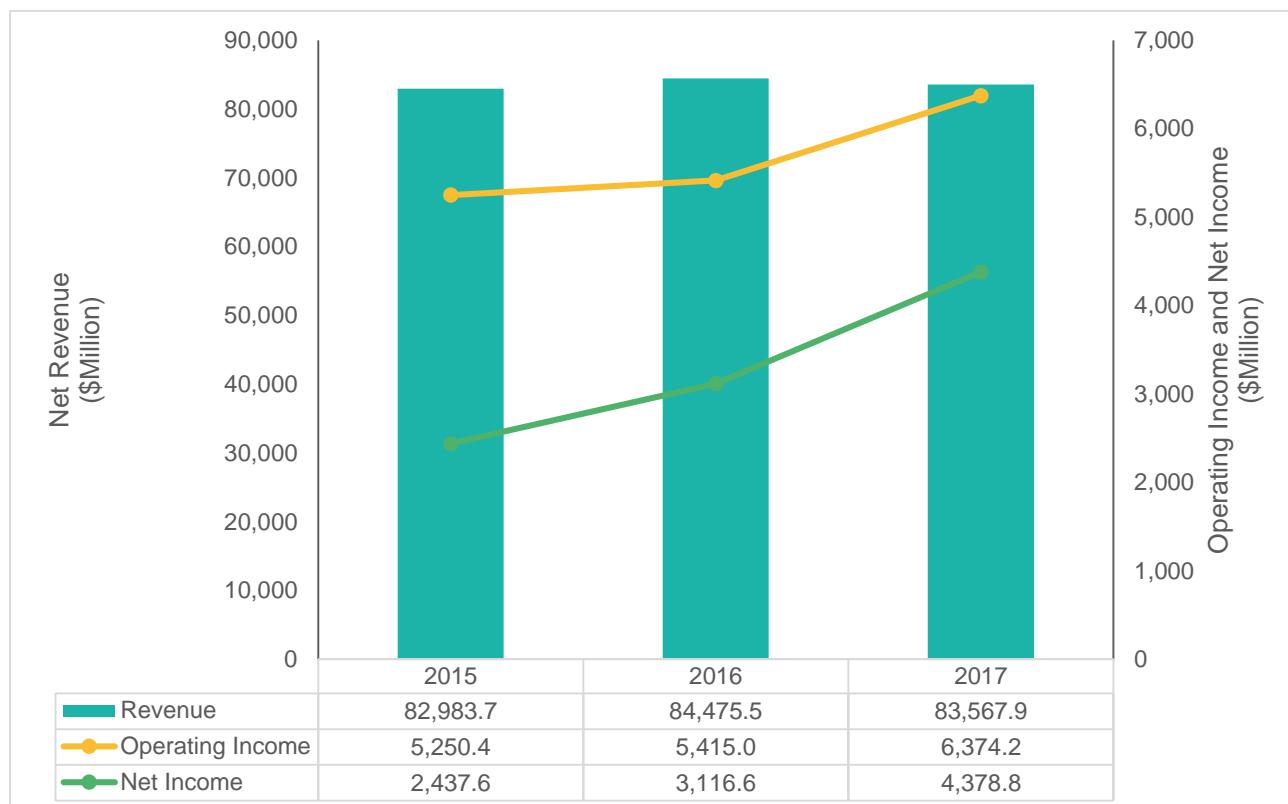
Source: Hitachi, Ltd. Website and BIS Research Analysis

The company incorporates mergers as its key strategy to expand its footprints in the developed and developing markets.

- In 2015, Hitachi Medical Corporation merged with Hitachi Aloka Medical to establish a new manufacturing facility. This reorganization will strengthen Hitachi's medical business segment.

8.6.3 Financials

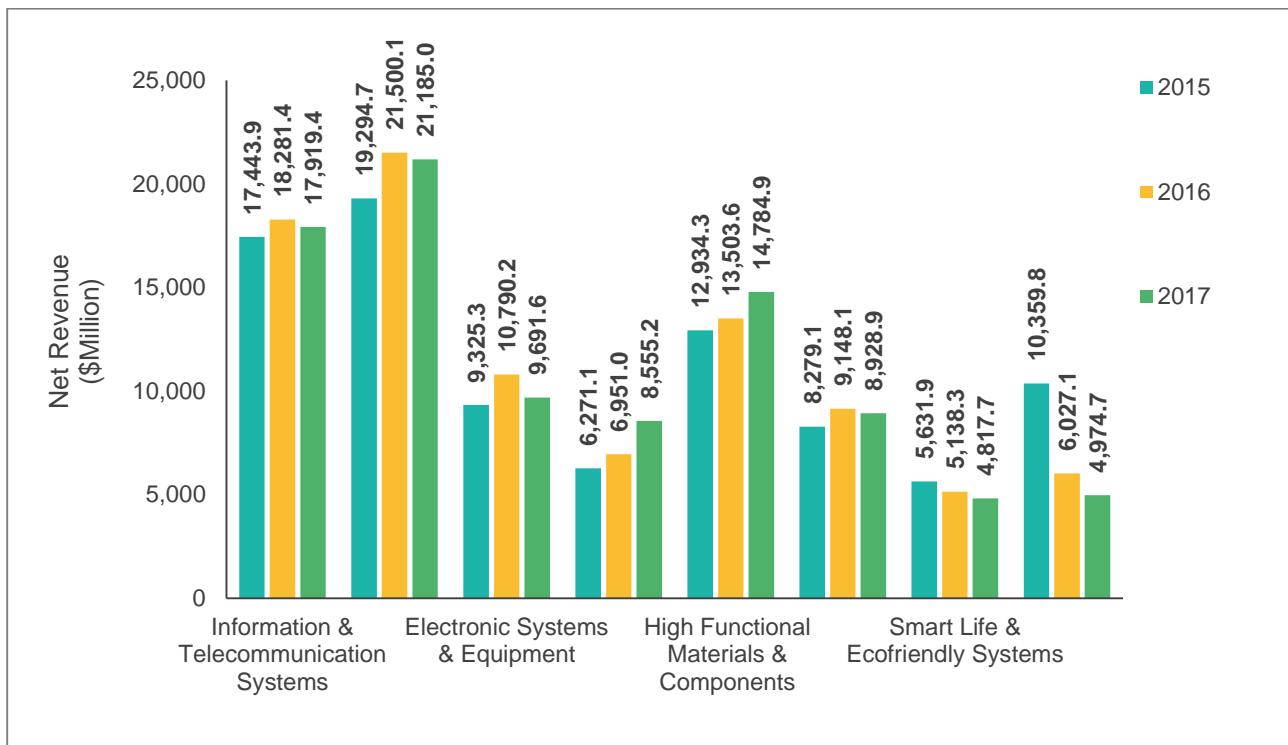
Figure: 8.28 Hitachi, Ltd. - Overall Financials, 2015-2017



Source: Hitachi, Ltd. Website and BIS Research Analysis

The financial year (FY) of the company starts from 1st April and ends on 31th March. The company generated a net revenue of \$83,567.9 million for the FY2017. The company reported a net decrease of \$907.6 million or -1.07% in its revenue in FY2017 from FY2016, driven primarily by uncertainty in currency exchange rates.

Company's operating income increased by 959.2 million or 17.71% in FY2017 when compared with FY2016, owing to the increased profit in Construction Machinery, Social Infrastructure & Industrial Systems, and Information & Telecommunication Systems segments.

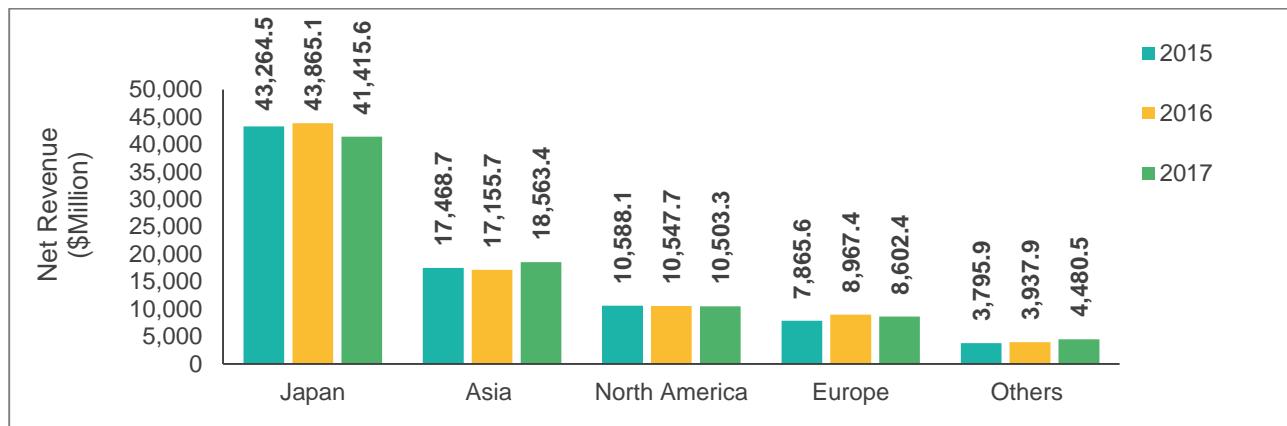
Figure: 8.29 Hitachi, Ltd. - Revenue (by Segment), 2015-2017


Source: Hitachi, Ltd. Website and BIS Research Analysis

The company reports its operations under eight segments, i.e., Information & Telecommunication Systems, Social Infrastructure & Industrial Systems, Electronic Systems & Equipment, Construction Machinery, High Functional Materials & Components, Automotive Systems, Smart Life & Eco-Friendly Systems, and Others.

Electronic Systems & Equipment Systems segment generated a revenue of \$9,691.6 million in FY2017, reporting a decrease of \$1,098.6 million or 10.18% when compared with that of FY2016. This decrease was primarily attributable to the fluctuation in exchange currency rates.

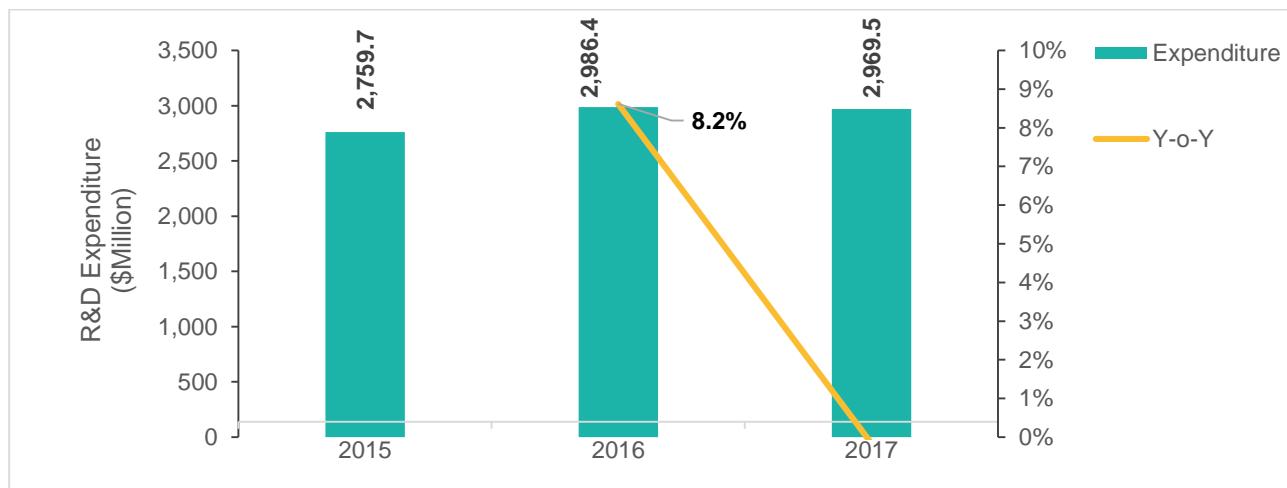
The Information & Telecommunication Systems segment generated a revenue of \$17,919.4 million in FY2017, the Social Infrastructure & Industrial Systems segment generated a revenue of \$21,185.0 million in FY2017, the Construction Machinery segment generated a revenue of \$8,555.2 million in FY2017, the High Functional Materials & Components segment generated a revenue of \$14,784.9 million in FY2017, the Automotive Systems segment generated a revenue of \$8,928.9 million in FY2017, the Smart Life & Eco-Friendly Systems segment generated a revenue of \$4,817.7 million in FY2017, and the others segment generated a revenue of \$4,974.7 million in FY2017.

Figure: 8.30 Hitachi, Ltd. - Revenue (by Region), 2015-2017


Source: Hitachi, Ltd. Website and BIS Research Analysis

The company reports its regional operations in five segments, namely, Japan, Asia, North America, Europe, and Others. The company generated 49.56% of its revenue for FY2017 from the Japan. As of FY2017, Japan generated a revenue of \$41,415.6 million, reporting a decrease of 5.58% from that of FY2016. This decrease was attributed to the lower revenue generation across all segments.

The Asia generated a revenue of \$18,563.4 million in FY2017, reporting a rise of 8.21% from that of FY2016 whereas North America generated a revenue of \$10,503.3 million in FY2017, reporting a decrease of 0.42% from that of FY2016. The Europe generated a revenue of \$8,602.4 million in FY2017.

Figure: 8.31 Hitachi, Ltd. - R&D Expenditure, 2015-2017


Source: Hitachi, Ltd. Website and BIS Research Analysis

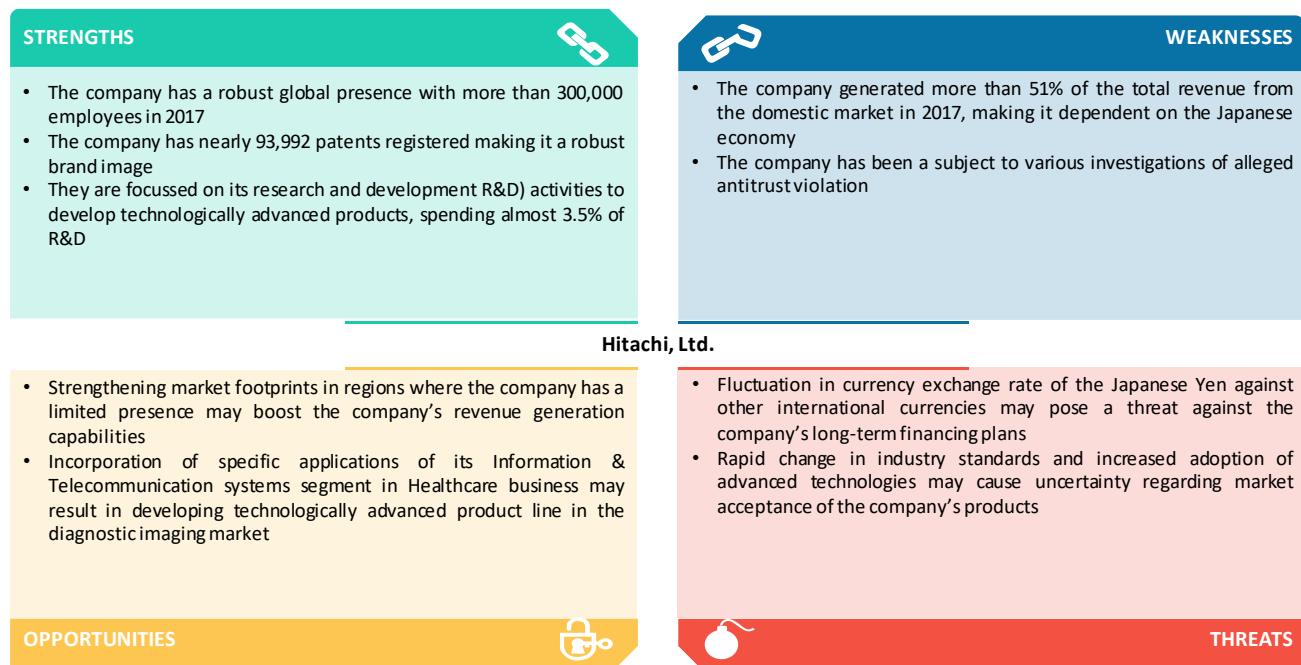
Hitachi, Ltd. invests significantly in its research and development (R&D) with reported expenses of \$2,969.5 million in FY2017, \$2,986.4 million in FY2016, and \$2,759.7 million in FY2015. The company has over 93,992 granted patents in FY2016.

The company is also engaged with various research and academic institutes to drives its research and development activities.

- For instance, in 2017, Hitachi collaborated with 243 research institutes in Japan and 65 research institutes outside Japan.

8.6.4 SWOT Analysis

Figure: 8.32 SWOT Analysis - Hitachi, Ltd.



Source: BIS Research Analysis

8.7 Konica Minolta, Inc.

8.7.1 Company Overview

Particular	Specifications (as of FY2017)
Website	www.konicaminolta.com
Headquarters	Tokyo, Japan
Year of Establishment	2003
Ownership Type	Public
Net Revenue	\$9,198.8 Million
Number of Employees	43,299
Subsidiaries	Konica Minolta Healthcare Americas, Inc. (U.S.), Konica Minolta Japan, Inc., MOBOTIX AG (Germany), Konica Minolta (China) Investment Ltd., and Ergo Asia Pty Limited (Australia), among others

Source: *Konica Minolta, Inc. Website and BIS Research Analysis*

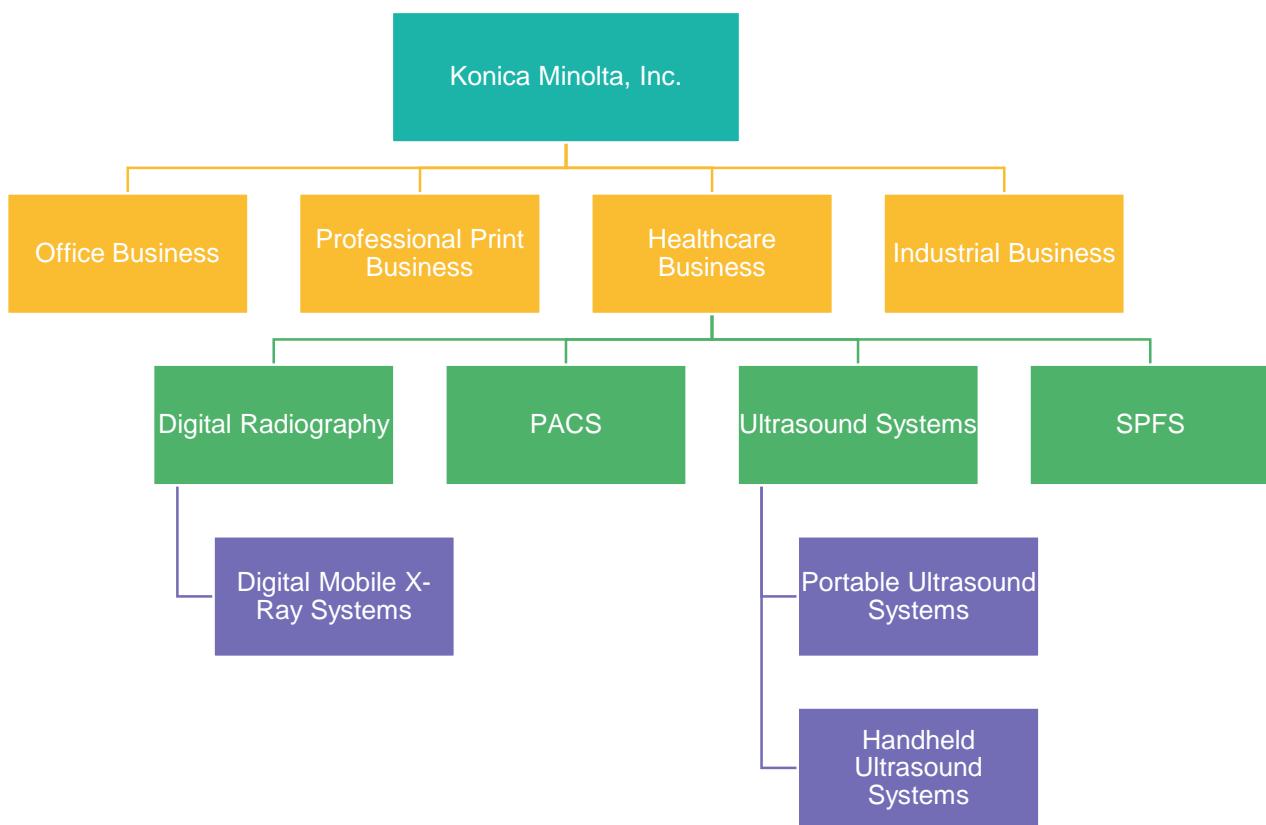
8.7.2 Role of Konica Minolta, Inc. in the Portable Imaging Solutions Market

Konica Minolta, Inc. was formed through the merger of Konica and Minolta in 2003. They offer products and services in more than 150 countries through its 163 consolidated subsidiaries. Its Healthcare Business offers digital radiography products, Picture Archiving and Communication Systems (PACS), diagnostic ultrasound systems, Surface Plasmon Field-enhanced Fluorescence Spectroscopy (SPFS) Systems. Company's key components used in the products are manufactured in Japan, and its final assembly is done in China and Malaysia.

Catering to the portable imaging solutions market, the company offers digital mobile X-ray systems and portable ultrasound systems. Konica Minolta, Inc. accounted for an estimated share of 5.26% in the global market value in 2017. In order to gain sufficient market share, the company is focused on launching the products on the regional level. For instance, company's SNiBLE yb handheld ultrasound system was launched in Japan only.

Some of the leading competitors of the company contributing significantly to the portable imaging solutions market include domestic players such as Canon Inc., Fujifilm Holdings Corporation, and Hitachi, Ltd., and international players such as General Electric Company, Koninklijke Philips N.V., and Siemens Healthineers, Inc., among others.

Figure: 8.33 Konica Minolta, Inc. - Product Portfolio for Portable Imaging Solutions Market



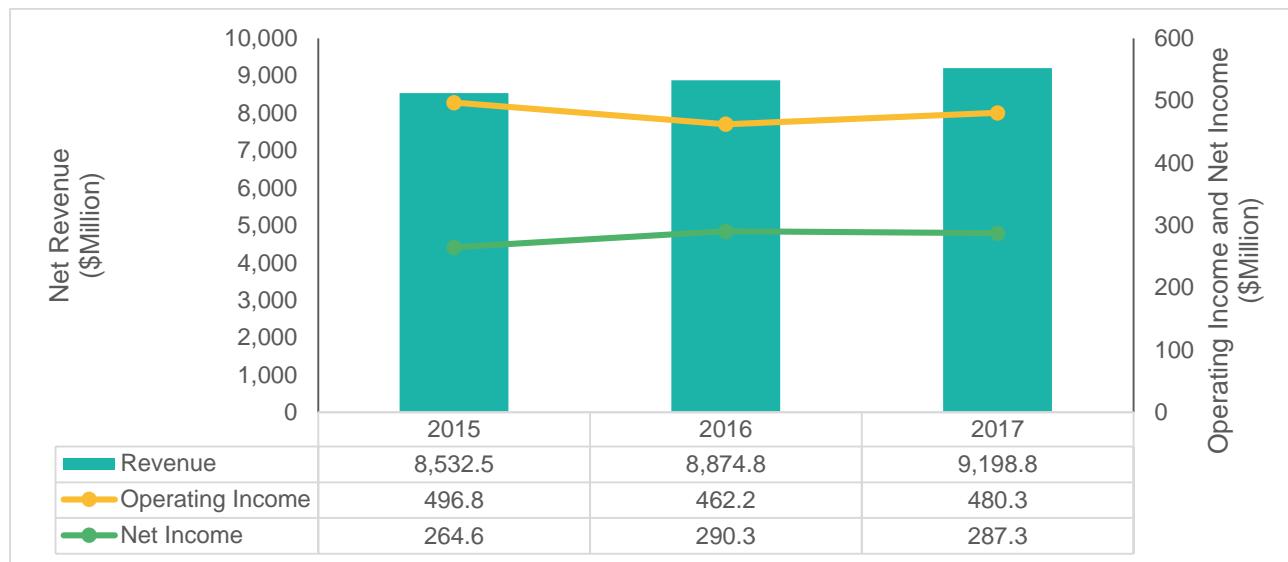
Source: Konica Minolta, Inc. Website and BIS Research Analysis

The company incorporates product launches as its key strategy to expand its product portfolio in the portable imaging solutions market. The significant product launches made by the company are:

- SONIMAGE MX1 portable ultrasound system in 2018. The company launched SONIMAGE MX1 portable ultrasound system. The product is designed for musculoskeletal, anesthesia and pain management applications.
- J5 and SONIMAGE HS1 portable ultrasound systems in 2018 and 2017, respectively. These systems are intended for musculoskeletal applications.

8.7.3 Financials

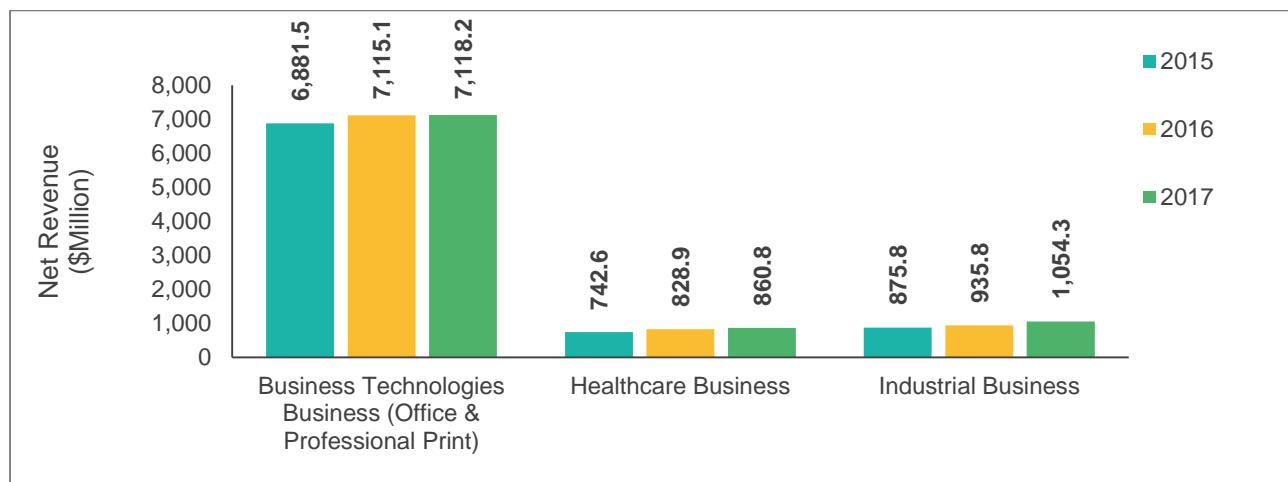
Figure: 8.34 Konica Minolta, Inc. - Overall Financials, 2015-2017



Source: Konica Minolta, Inc. Website and BIS Research Analysis

The financial year (FY) of the company starts from 1st April and ends on 31th March. The company generated a net revenue of \$9,198.8 million for the FY2017. The company reported a net increase of \$324.0 million or 3.65% in its revenue in FY2017 from FY2016, driven primarily by strong sales of multi-functional peripherals systems and digital healthcare products in North America region, and also due to strong sales in China.

Figure: 8.35 Konica Minolta, Inc. - Revenue (by Segment), 2015-2017

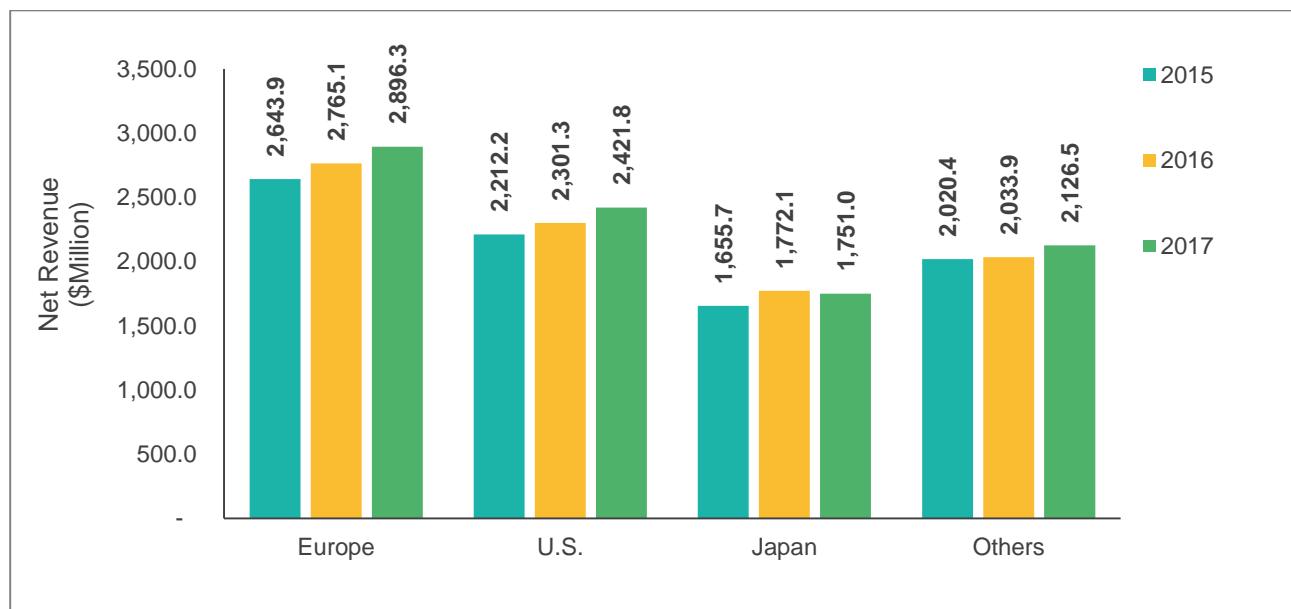


Source: Konica Minolta, Inc. Website and BIS Research Analysis

The company reports its operations under three segments: Business Technologies Business (Office and Professional Print), Healthcare Business, and Industrial Business. The Healthcare Business segment generated a revenue of \$860.8 million in FY2017, reporting an increase of 10.95% when compared with that of FY2016. This increase was primarily attributable to the strong sales growth of digital radiography systems in the U.S. owing to the acquisitions of contracts and collaboration with X-Ray systems manufacturers.

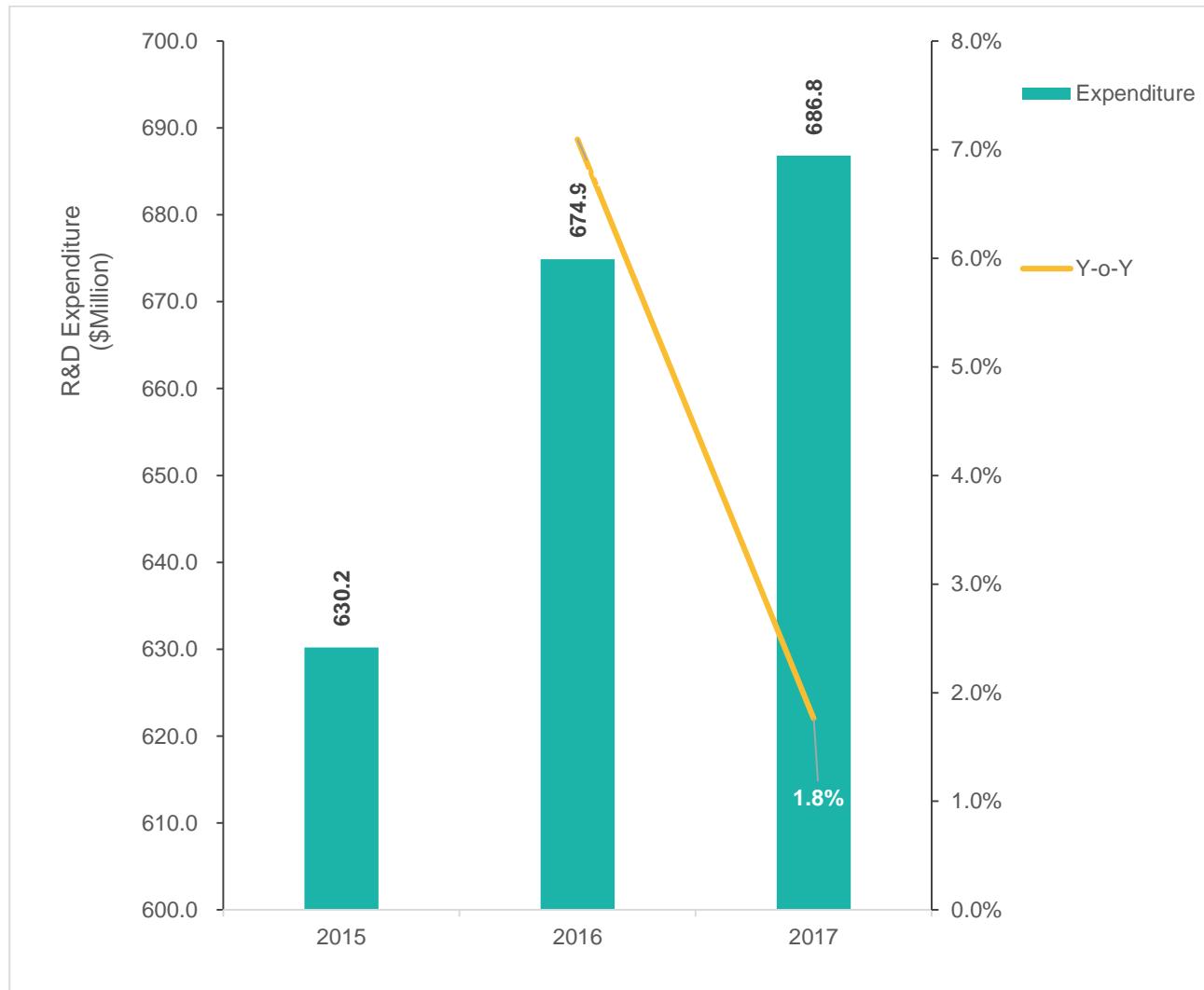
The Business Technologies Business segment generated a revenue of \$7,118.2 million in FY2017 and the Industrial Business segment generated a revenue of \$1,054.3 million in FY2017.

Figure: 8.36 Konica Minolta, Inc. - Revenue (by Region), 2015-2017



Source: Konica Minolta, Inc. Website and BIS Research Analysis

The company reports its regional operations in four segments: Europe, U.S., Japan, and Others. The company generated 31.50% of its revenue for FY2017 from the Europe. As of FY2017, the U.S. generated a revenue of \$2,421.8 million, reporting a rise of 12.43% from that of FY2016. The Japan generated a revenue of \$1,751.0 million in FY2017, reporting a rise of 5.57% from that of FY2016.

Figure: 8.37 Konica Minolta, Inc. - R&D Expenditure, 2015-2017


Source: Konica Minolta, Inc. Website and BIS Research Analysis

Konica Minolta, Inc. invests significantly in its research and development (R&D) activities with reported expenses of \$686.8 million in FY2017 and \$674.9 million in FY2015. The company has over 21,276 granted patents in FY2017. Research is conducted for the development of new products as well as newer applications for the already present products.



BIS Research

8.7.4 SWOT Analysis

Figure: 8.38 SWOT Analysis - Konica Minolta, Inc.

STRENGTHS	LINK	WEAKNESSES
<ul style="list-style-type: none">The company has a strong customer base in Japan centered on medical clinicsThe company has adopted technological advanced knowledge and expertise, especially in medical imaging domainKonica Minolta is focussed on expanding and enhancing its X-ray diagnostic imaging systems segment and strengthening sale channels through strategic collaborations		<ul style="list-style-type: none">The company has limited business sites and operation functions outside JapanA decrease in net income will hamper the company's brand image. For instance, net income is decreased by -1.6% in 2016 when compared to FY2015The company is highly dependent on the domestic market with 72 consolidated subsidiaries in Japan alone
Konica Minolta Inc.		
<ul style="list-style-type: none">Applying digital and IT technologies in the medical diagnostic imaging systems could result in accelerating the company's revenue generation capabilitiesHigh demand from the ASEAN countries and other developing economies and expanding an overseas business can provide a robust brand image and market share		<ul style="list-style-type: none">Decline investments owing to the economic downturns caused by healthcare reform and other factors may pose a threat towards revenue generation capabilitiesIncreasing number of start-up organisations and established IT firms utilizing advanced technologies may pose a threat to the company's business
OPPORTUNITIES		
THREATS		

Source: BIS Research Analysis



8.8 Koninklijke Philips N.V.

8.8.1 Company Overview

Particular	Specifications (as of FY2017)
Website	www.philips.com
Headquarters	Amsterdam, Netherlands
Year of Establishment	1891
Ownership Type	Public
Net Revenue	\$20,087.1 Million
Number of Employees	73,951
Subsidiaries	Philips do Brasil Ltda., Philips Mexicana, S.A. De C.V. (Mexico), Philips Malaysia Sdn. Bhd., and Philips Medical Systems Technologies Ltd. (Israel), among others

Source: Koninklijke Philips N.V. Website and BIS Research Analysis

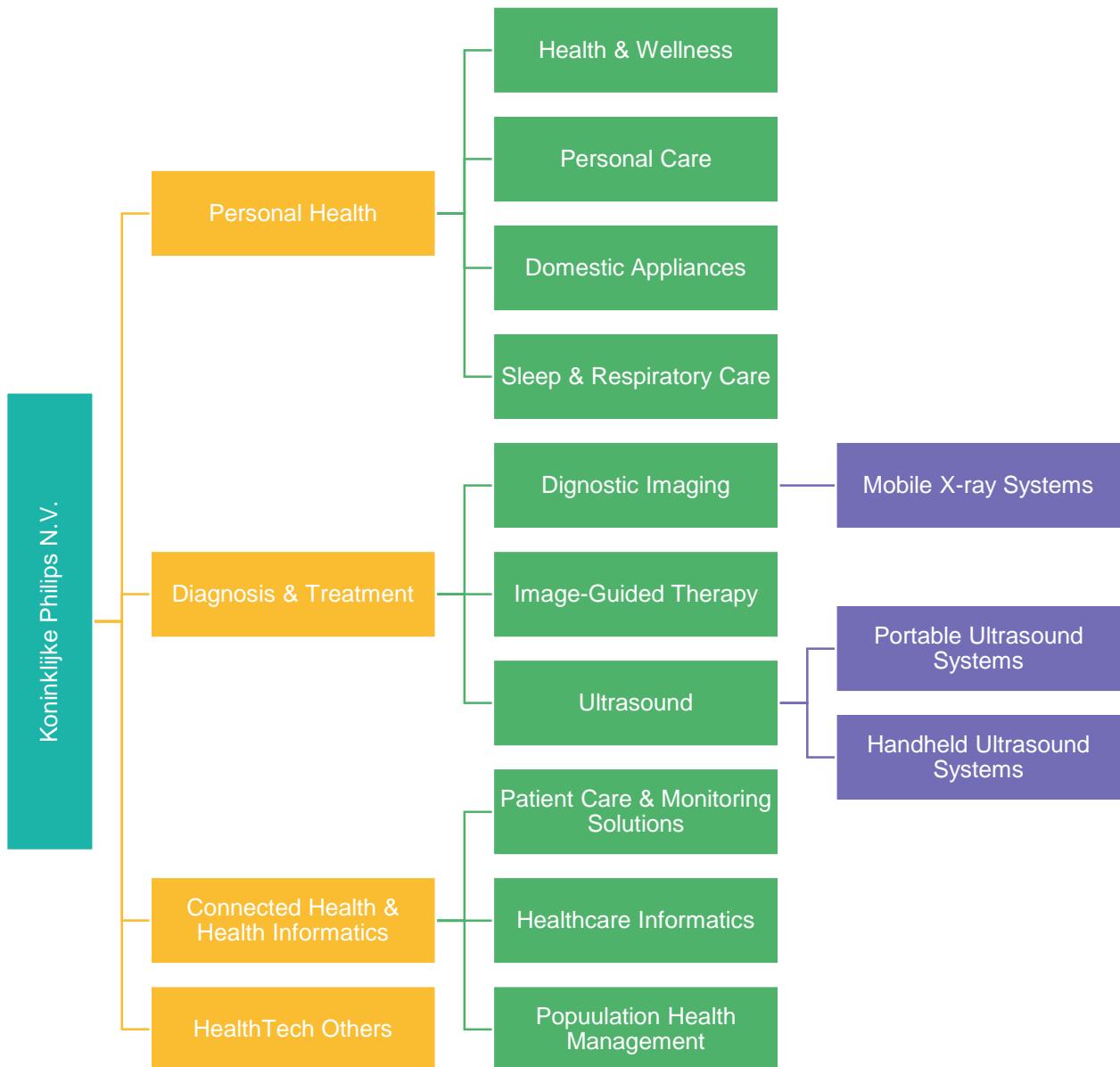
8.8.2 Role of Koninklijke Philips N.V. in the Portable Imaging Solutions Market

Koninklijke Philips N.V. is engaged in developing, manufacturing, and marketing of health technology products and services. The company offers personal health products such as wellness & health products, personal care products, domestic appliances, and sleep & respiratory care products. Company also offers diagnosis & treatment products such as diagnostic imaging systems and image-guided therapies. Its connected care & health informatics segment offers healthcare IT solutions such as patient care & monitoring solutions, population health management solutions, and healthcare informatics solutions.

Catering to the portable imaging solutions market, the company offers handheld and portable ultrasound systems and digital mobile x-ray systems. The company accounted for an estimated share of 17.82% in the global market value in 2017. The company holds a strong market presence in the domestic business segment with several facilities across the region, which include office spaces, R&D units, production centers, warehouse centers, and data centers. Koninklijke Philips N.V. also boasts of a widely global presence with facilities present in major regions namely Western Europe, Middle East, Africa, and several growth geographies.

Some of the leading competitors of the company contributing significantly to the portable imaging solutions market include Canon Inc., Fujifilm Holdings Corporation, and Hitachi, Ltd., General Electric Company, and Siemens Healthineers, Inc., among others.

Figure: 8.39 Koninklijke Philips N.V. - Product Portfolio for Portable Imaging Solutions Market



Source: Koninklijke Philips N.V. Website and BIS Research Analysis

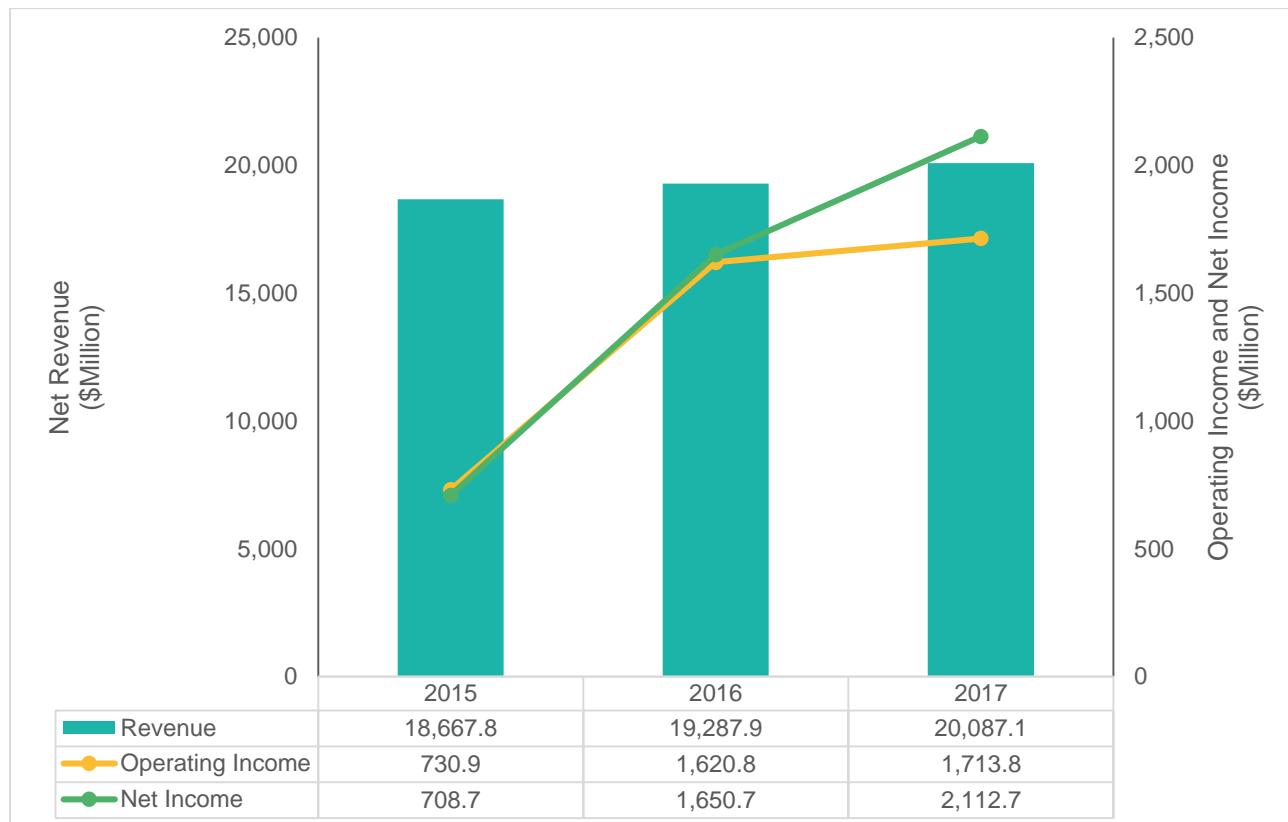
The company seeks partnership and collaboration as its key strategies to expand its product portfolio in the portable imaging solutions market. The significant strategies made by the company is:

- Partnership: In May 2018, the company partnered with Hologic, Inc. The partnership offers care integrated solutions comprising diagnostic imaging modalities, advanced informatics and services for screening, diagnosis and treatment of women on the global level.

- Collaboration: In April 2017, the company signed a multi-year strategic alliance with B. Braun Melsungen AG to innovate ultrasound-guided systems for regional anesthesia and vascular access applications.

8.8.3 Financials

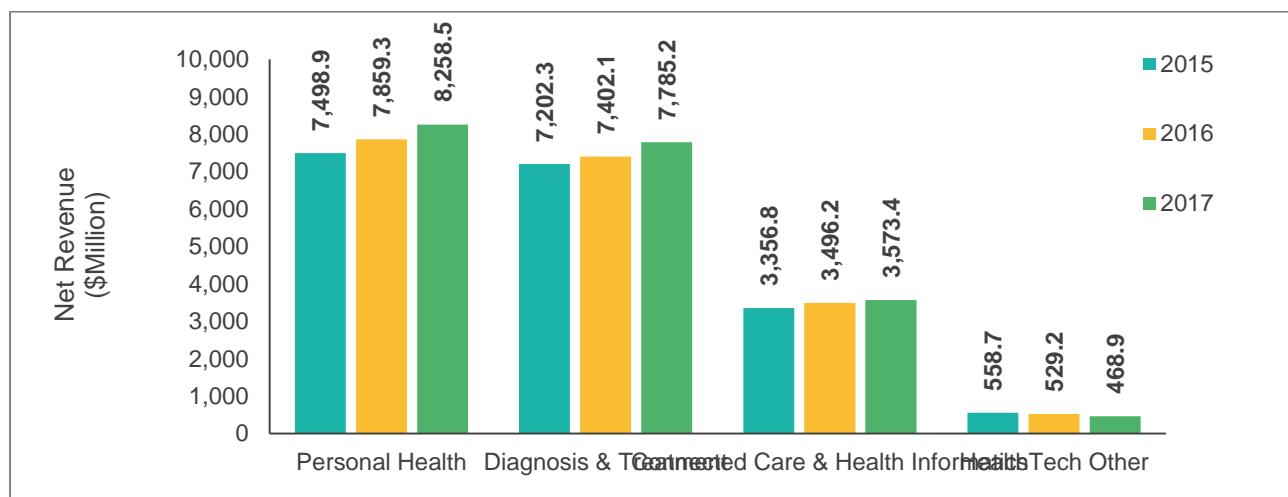
Figure: 8.40 Koninklijke Philips N.V. - Overall Financials, 2015-2017



Source: Koninklijke Philips N.V. Website and BIS Research Analysis

The financial year (FY) of the company starts from 1st January and ends on 31th December. The company generated a net revenue of \$20,087.1 million for the FY2017. The company reported a net increase of \$799.2 million or 4.14% in its revenue in FY2017 from FY2016, driven primarily by increased sales in Personal Health businesses, Connected Care & Health Informatics businesses, and Diagnosis & Treatment businesses.

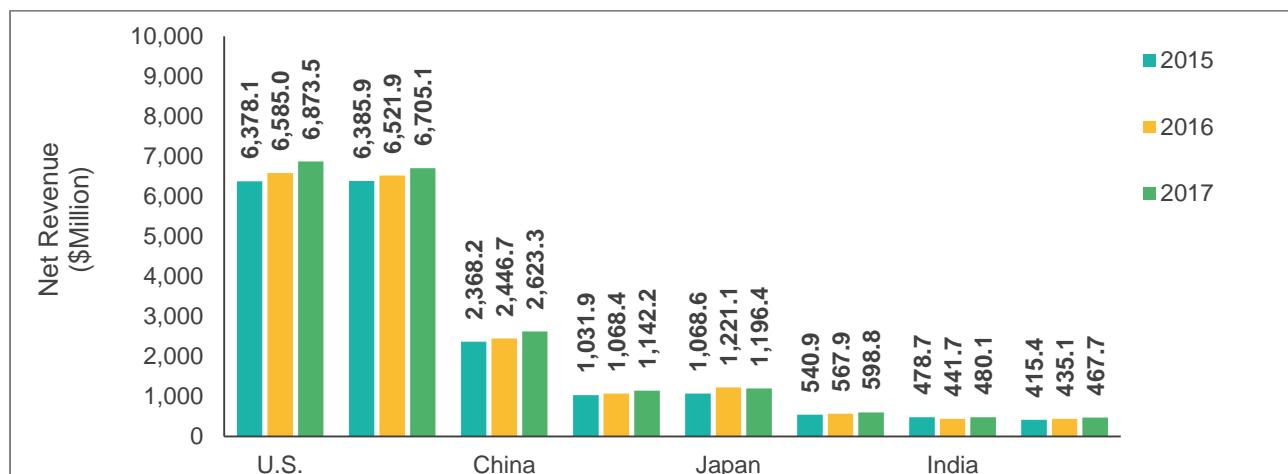
The company's net income reported a net increase of 27.99% when compared with FY2016, driven by lower net financial expenses, and improvement in operational performances.

Figure: 8.41 Koninklijke Philips N.V. - Revenue (by Segment), 2015-2017


Source: Koninklijke Philips N.V. Website and BIS Research Analysis

The company reports its operations under four segments: Personal Health, Diagnosis & Treatment, Connected Care & Health Informatics, and HealthTech Other. Personal Health segment generated a revenue of \$8,258.5 million in FY2017, reporting a rise of 5.1% when compared with that of FY2016, driven by single-digit growth in Domestic Appliances, Sleep & Respiratory Care, and Personal Care segment and high-single-digit growth in Health & Wellness segment.

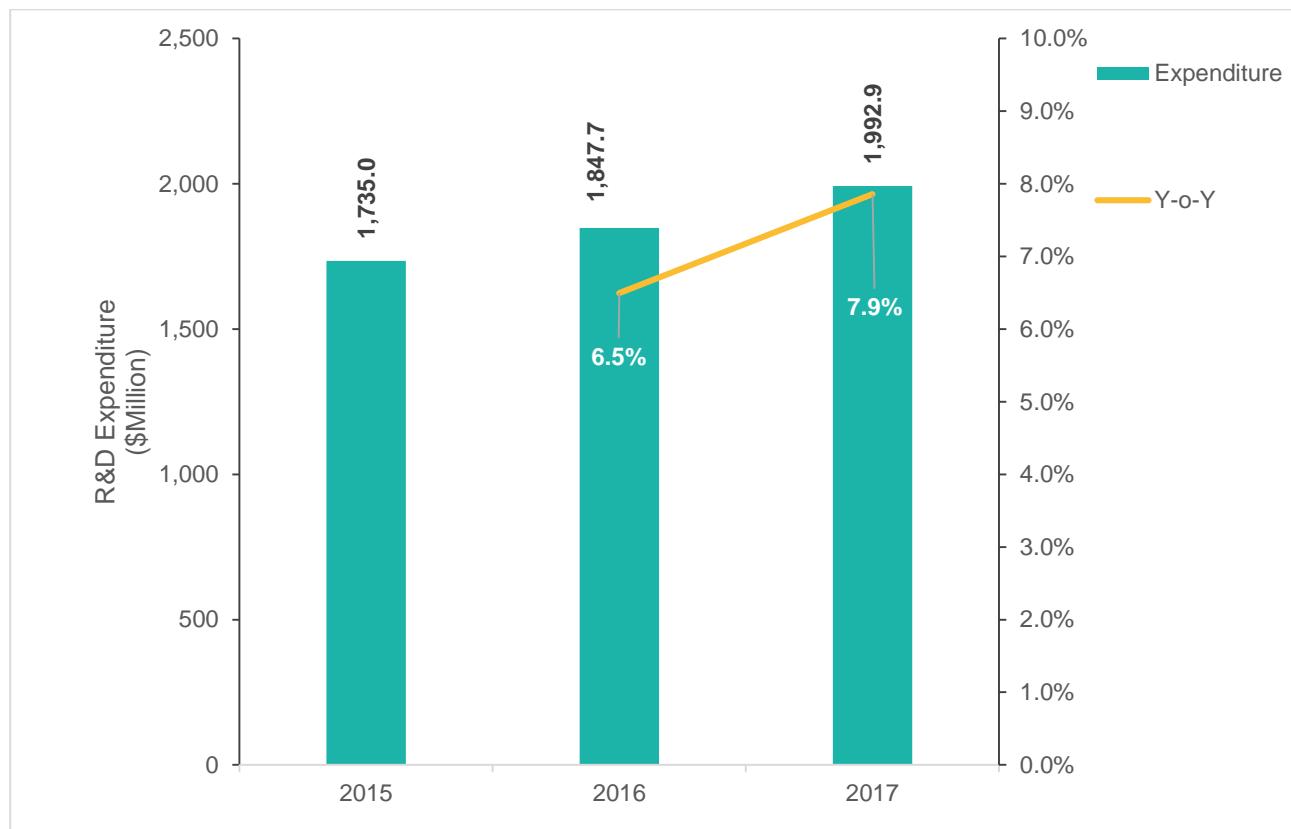
Diagnosis & Treatment segment generated a revenue of \$7,785.2 million in FY2017, reporting a rise of 5.2% when compared with that of FY2016, driven by increased sales in ultrasound segment. Connected Care & Health Informatics segment generated a revenue of \$3,573.4 million in FY2017.

Figure: 8.42 Koninklijke Philips N.V. - Revenue (by Region), 2015-2017


Source: Koninklijke Philips N.V. Website and BIS Research Analysis

The company reports its regional operations in eight segments: U.S., China, Germany, Japan, France, India, Netherlands, and other countries. The company generated 34.21% of its revenue for FY2017 from the U.S. alone. As of FY2017, U.S. generated a revenue of \$6,873.5 million, reporting a rise of 4.38% from that of FY2016. China generated a revenue of \$2,623.3 million in FY2017, reporting a rise of 7.22% from that of FY2016. The Germany generated a revenue of \$1,142.2 million in FY2017. The Japan generated a revenue of \$1,196.4 million in FY2017.

Figure: 8.43 Koninklijke Philips N.V. - R&D Expenditure, 2015-2017



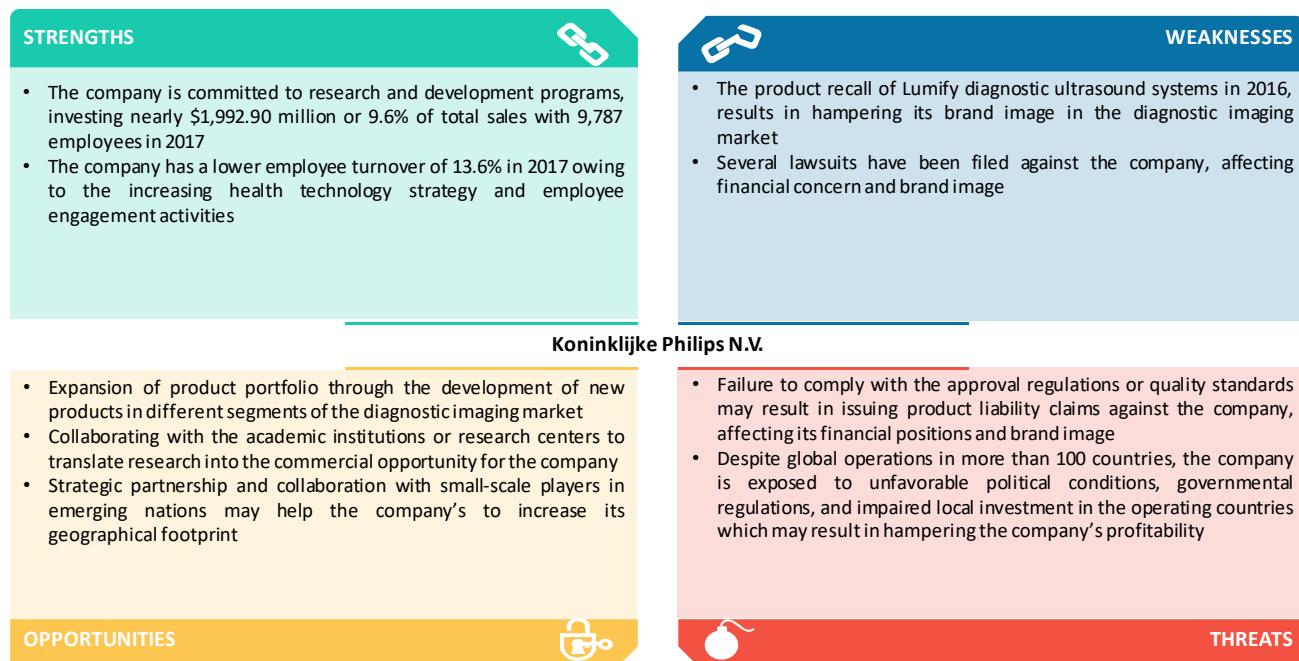
Source: Koninklijke Philips N.V. Website and BIS Research Analysis

Koninklijke Philips N.V. invests significantly in its research and development with reported expenses of \$1,992.9 million in FY2017, \$1,847.7 million in FY2016, and \$1,735.0 million in FY2015.

The company has 9,797, 9,087, and 8,242 employees in its R&D centers in FY2017, FY2016, and FY2015, respectively.

8.8.4 SWOT Analysis

Figure: 8.44 SWOT Analysis - Koninklijke Philips N.V.



Source: BIS Research Analysis



8.9 Samsung Electronics Co., Ltd.

8.9.1 Company Overview

Particular	Specifications (as of FY2017)
Website	www.samsung.com
Headquarters	Seoul, South Korea
Year of Establishment	1969
Ownership Type	Public
Net Revenue	\$2,13,244.0 Million
Number of Employees	320,671
Subsidiaries	Samsung Medison Co., Ltd. (South Korea), and Samsung Neurologica Corporation (U.S.), among others

Source: *Samsung Electronics Co., Ltd. Website and BIS Research Analysis*

8.9.2 Role of Samsung Electronics Co., Ltd. in the Portable Imaging Solutions Market

Samsung Electronics Co., Ltd. offers products and services for telecommunication, audio and video, healthcare, and environment and energy applications. The company operates through three reportable segments, namely, Consumer Electronics, IT & Mobile Communications, and Device Solutions. Consumer Electronics segment offers monitors, televisions, refrigerators, medical devices, washing machine, and other devices. The IT & Mobile Communications segment offers computers, mobile phones, network systems, and other communication devices. The Device Solutions offers components for the use in mobile devices and IT applications. Company has over 15 regional offices, 55 sales offices, 39 production sites, 35 research and development centers, and 7 design centers, globally

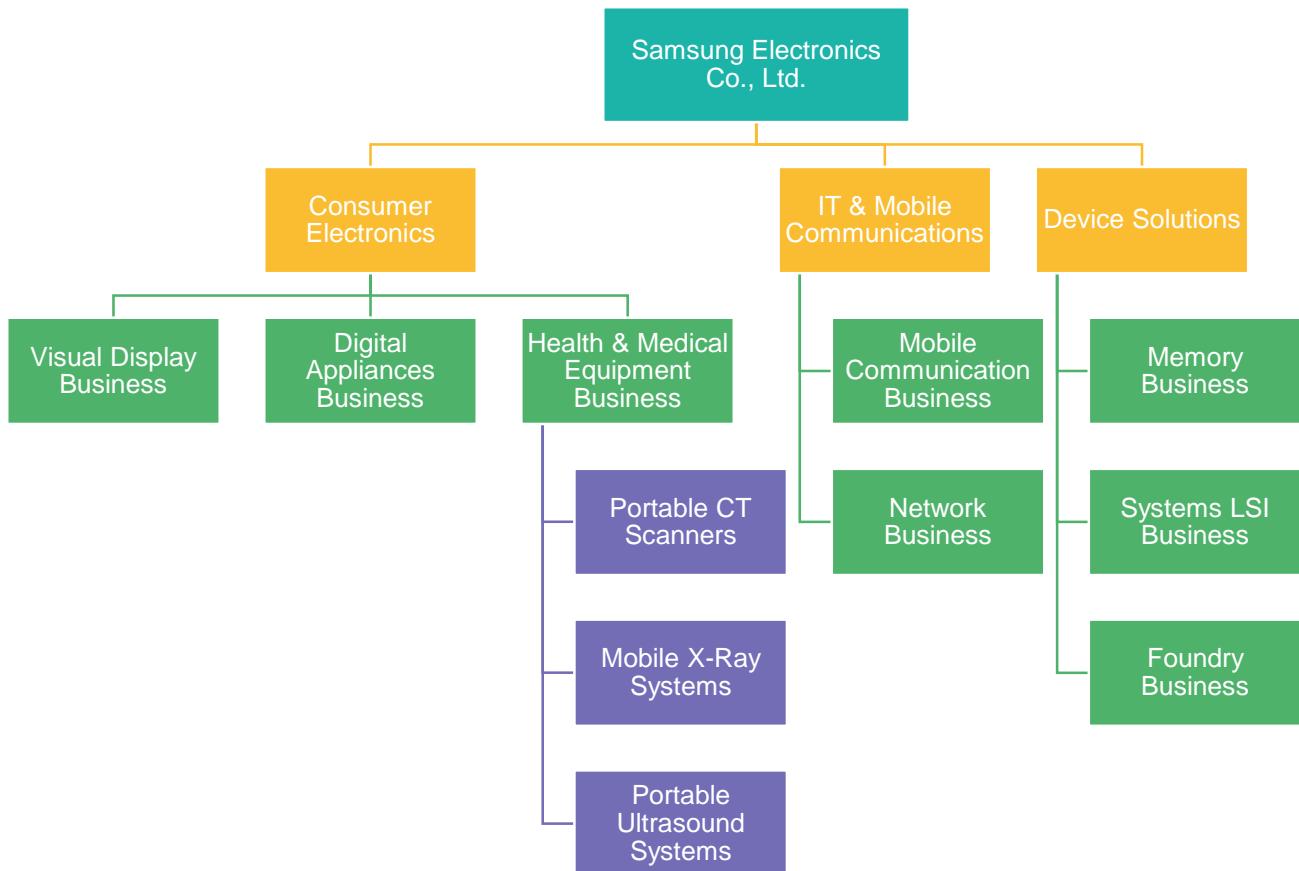
Catering to the market, the company offers portable CT scanners, digital mobile X-ray systems, and portable ultrasound systems. The company accounted for an estimated share of 11.73% in the global market value in 2017. For portable CT scanners market, company accounted nearly 96.99% of the total market share in 2017. This market dominance is attributed to the limited number of players in the portable CT scanners market.

Some of the leading competitors of the company contributing significantly to the portable imaging solutions market include Analogic Corporation, Canon Inc., Fujifilm Holdings Corporation, General



Electric Company, Hitachi, Ltd., Konica Minolta, Inc., Koninklijke Philips N.V., Shimadzu Corporation and Siemens Healthineers, Inc., among others.

Figure: 8.45 Samsung Electronics Co., Ltd. - Product Portfolio for Portable Imaging Solutions Market



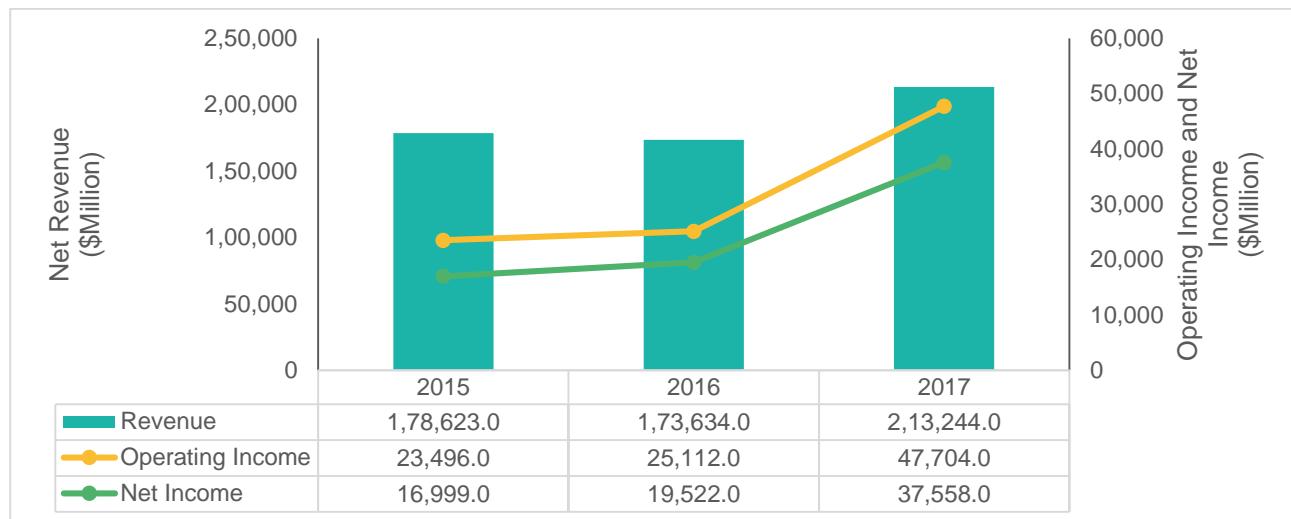
Source: Samsung Electronics Co., Ltd. Website and BIS Research Analysis

The company incorporates product launches as its key strategy to expand its product portfolio in the portable imaging solutions market. The significant product launches made by the company is:

- The company launched OmniTom and BodyTom Elite Portable CT Scanners in 2017 to gain sufficient market share in the portable CT scanners.

8.9.3 Financials

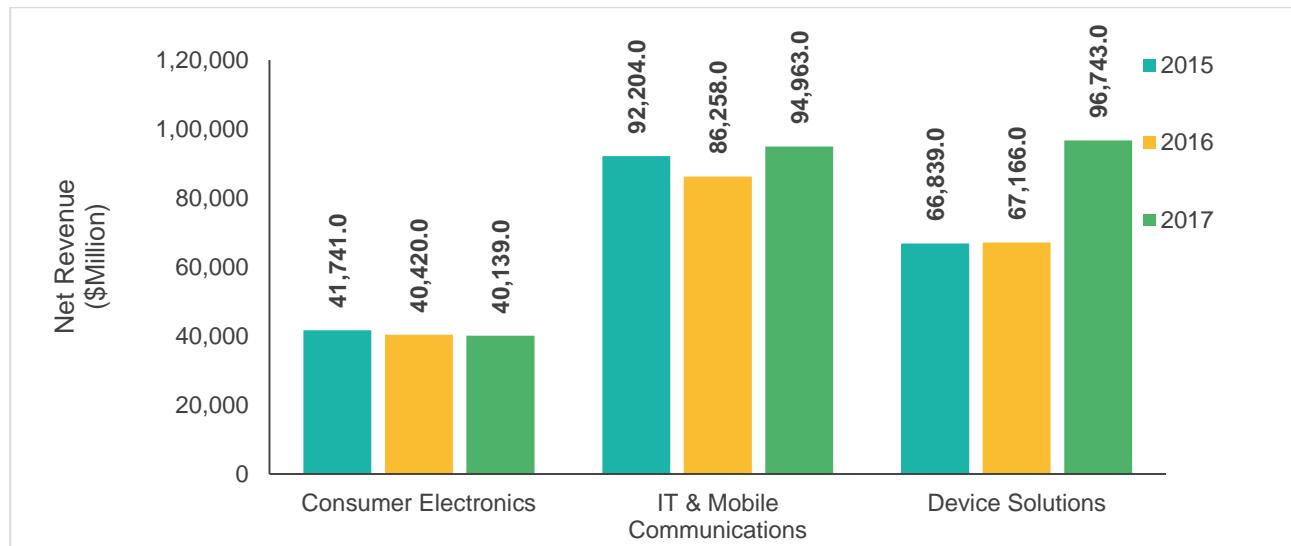
Figure: 8.46 Samsung Electronics Co., Ltd. - Overall Financials, 2015-2017



Source: Samsung Electronics Co., Ltd. Website and BIS Research Analysis

The financial year (FY) of the company starts from 1st January and ends on 31th December. The company generated a net revenue of \$2,13,244.0 million for the FY2017. The company reported a net increase of \$39,610.0 million or 22.81% in its revenue in FY2017 from FY2016, driven primarily by increased sales in all the segments. The company reported a net decrease of \$4,989.0 million or 2.79% in its revenue in FY2016 from FY2015.

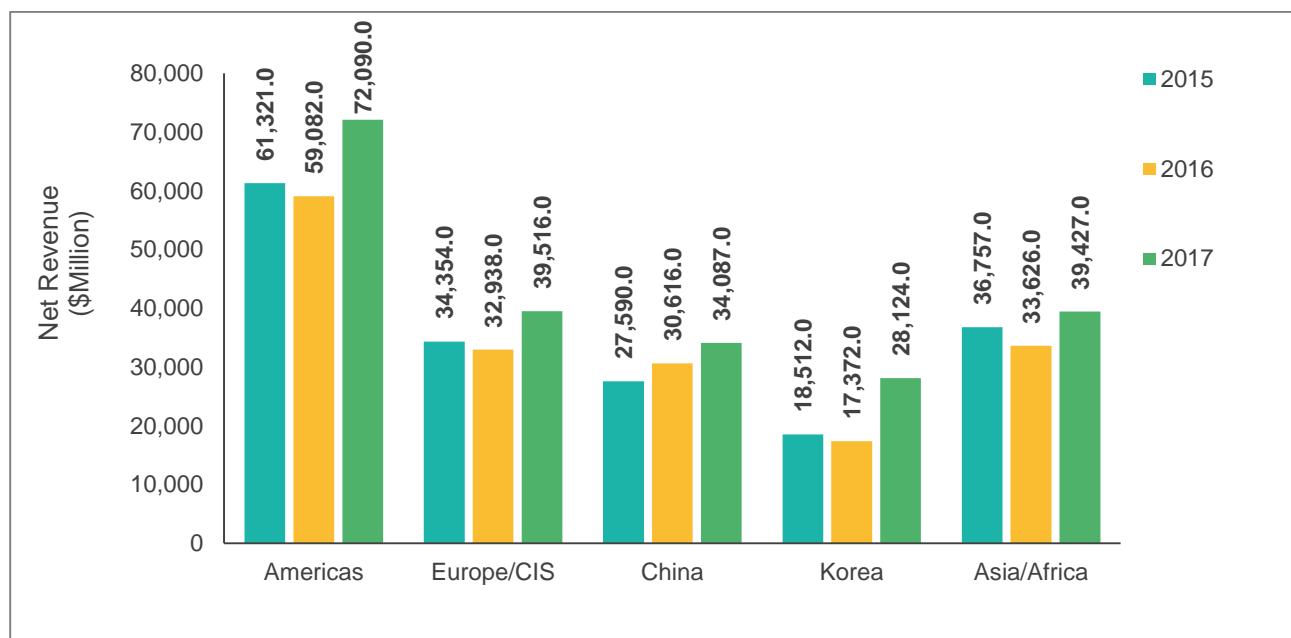
Figure: 8.47 Samsung Electronics Co., Ltd. - Revenue (by Segment), 2015-2017



Source: Samsung Electronics Co., Ltd. Website and BIS Research Analysis

The company reports its operations under three segments: Consumer Electronics, IT & Mobile Communications, and Device Solutions. Consumer Electronics segment generated a revenue of \$40,139.0 million in FY2017, reporting a decrease of 0.70 % when compared with that of FY2016. The IT & Communications segment generated a revenue of \$94,963.0 million in FY2017, reporting a rise of 10.09% when compared with that of FY2016. The Device Solutions segment generated a revenue of \$96,743.0 million in FY2017, reporting a rise of 44.04% when compared with that of FY2016.

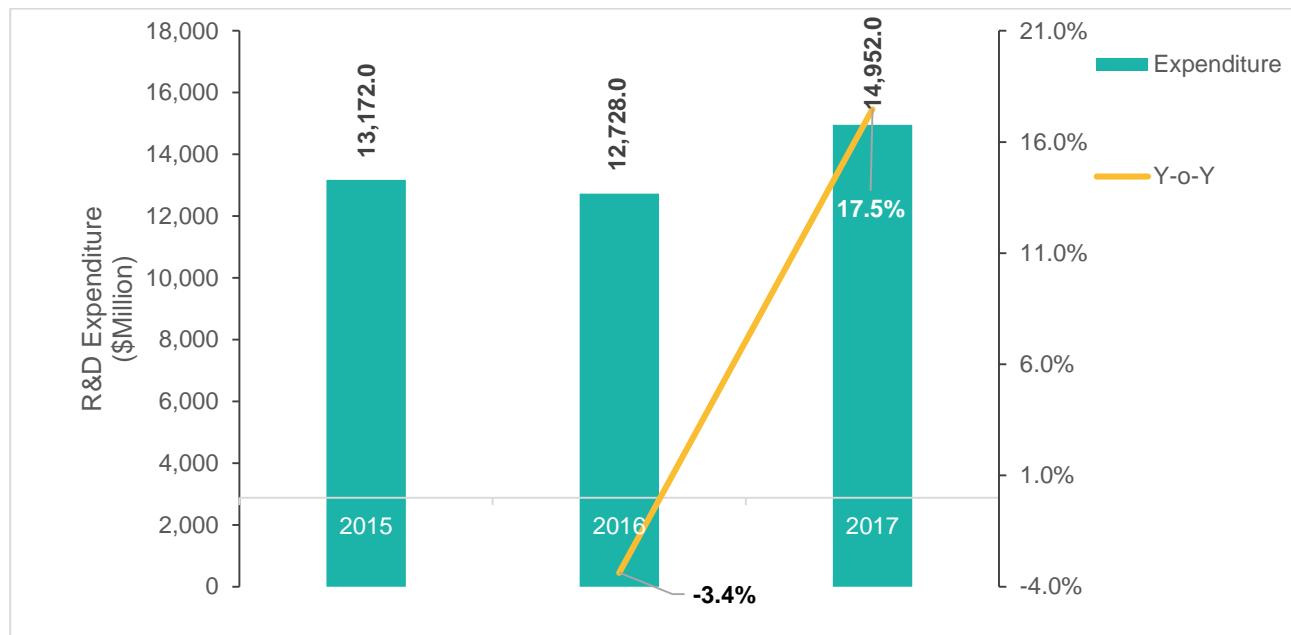
Figure: 8.48 Samsung Electronics Co., Ltd. - Revenue (by Region), 2015-2017



Source: *Samsung Electronics Co., Ltd. Website and BIS Research Analysis*

The company reports its regional operations in five segments: Americas, Europe/CIS, China, Korea, and Asia/Africa. The company generated 33.81% of its revenue for FY2017 from the Americas alone. As of FY2017, Americas generated a revenue of \$72,090.0 million, reporting a rise of 22.02% from that of FY2016. Europe/CIS generated a revenue of \$39,516.0 million in FY2017. The Korea generated a revenue of \$28,124.0 million in FY2017. The Asia/Africa generated a revenue of \$39,427.0 million in FY2017.

Figure: 8.49 Samsung Electronics Co., Ltd. - R&D Expenditure, 2015-2017



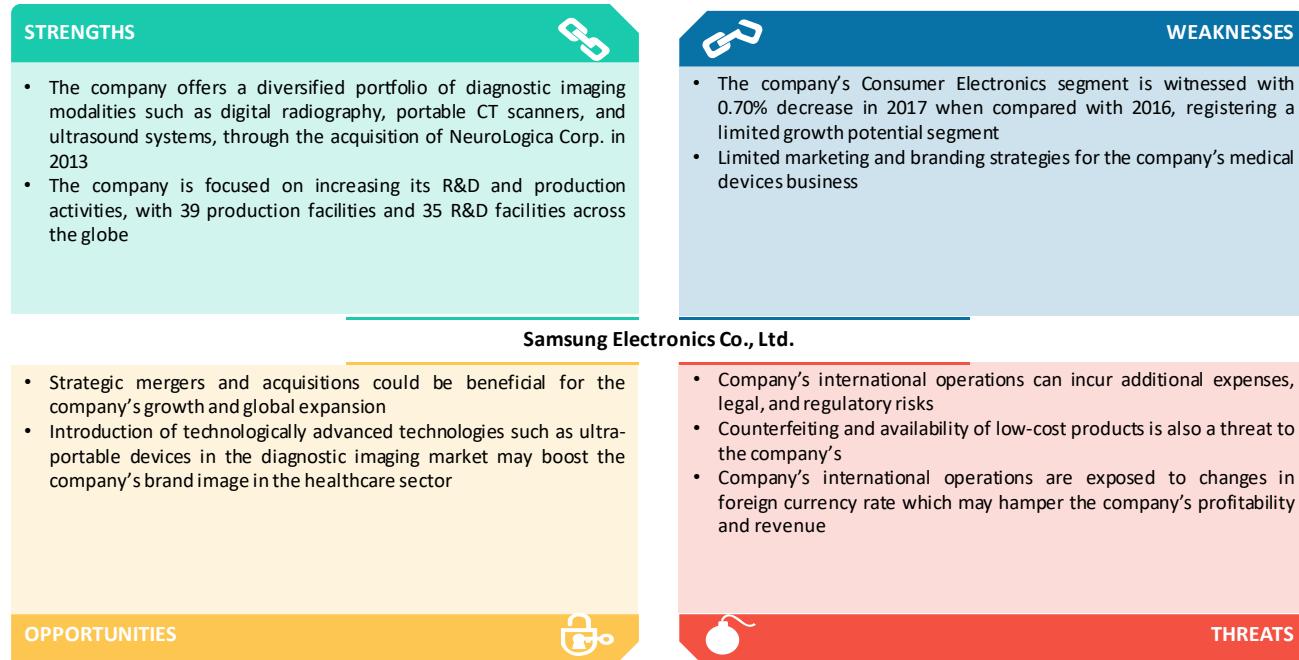
Source: *Samsung Electronics Co., Ltd. Website and BIS Research Analysis*

Samsung Electronics Co., Ltd. invests significantly in its research and development (R&D) with reported expenses of \$14,952.0 million in FY2017, \$12,728.0 million in FY2016, and \$13,172.0 million in FY2015.

The company has over 35 research and development (R&D) centers, with 2 centers in CIS, 8 centers in China, 2 centers in Southeast Asia, 2 centers in Japan, 4 centers in Korea, 3 centers in Europe, 4 centers in Middle East, 5 centers in Southwest Asia, 4 centers in North America, and 1 centers in Latin America.

8.9.4 SWOT Analysis

Figure: 8.50 SWOT Analysis - Samsung Electronics Co., Ltd.



Source: BIS Research Analysis

8.10 Shimadzu Corporation

8.10.1 Company Overview

Particular	Specifications (as of FY2017)
Website	www.shimadzu.com
Headquarters	Kyoto, Japan
Year of Establishment	1875
Ownership Type	Public
Net Revenue	\$3,358.6 Million
Number of Employees	11,954
Subsidiaries	Shimadzu Scientific Instruments Incorporated (U.S.), Shimadzu (Hong Kong) Limited, Shimadzu Europe Ltd., and Shimadzu Europa GmbH (Germany), among others

Source: *Shimadzu Corporation Website and BIS Research Analysis*

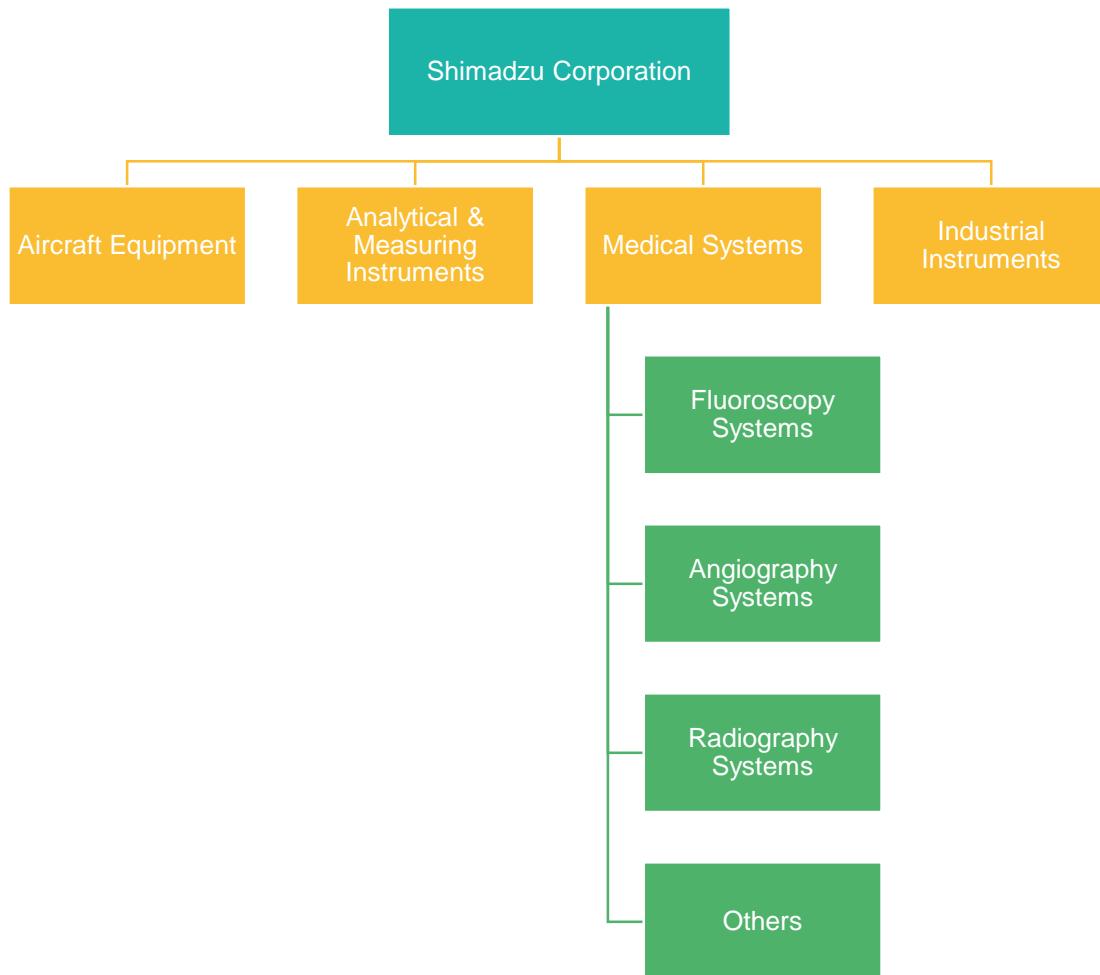
8.10.2 Role of Shimadzu Corporation in the Portable Imaging Solutions Market

The company markets analytical and measuring instruments, industrial machinery, medical systems, and aircraft equipment in Asia-Pacific, Europe, Americas regions through its 51 affiliated companies. The company operates through four reportable segments: Medical Systems, Aircraft Equipment, Industrial Machinery, and Analytical and Measuring Instruments.

The Medical Systems segment offers fluoroscopy systems, angiography systems, mobile and general radiography systems, near-infrared imaging systems, medical information systems, and tumor-tracking systems. Catering to the market, the company offers diverse range of both analog and digital mobile X-ray systems. The company accounted for an estimated share of 1.57% in the global market value in 2017.

Some of the leading competitors of the company contributing significantly to the portable imaging solutions market include General Electric Company, Siemens Healthineers, Inc., Konica Minolta, Inc., Villa Sistemi Medicali SpA, and Samsung Electronics Co., Ltd., among others.

Figure: 8.51 Shimadzu Corporation - Product Portfolio for Portable Imaging Solutions Market



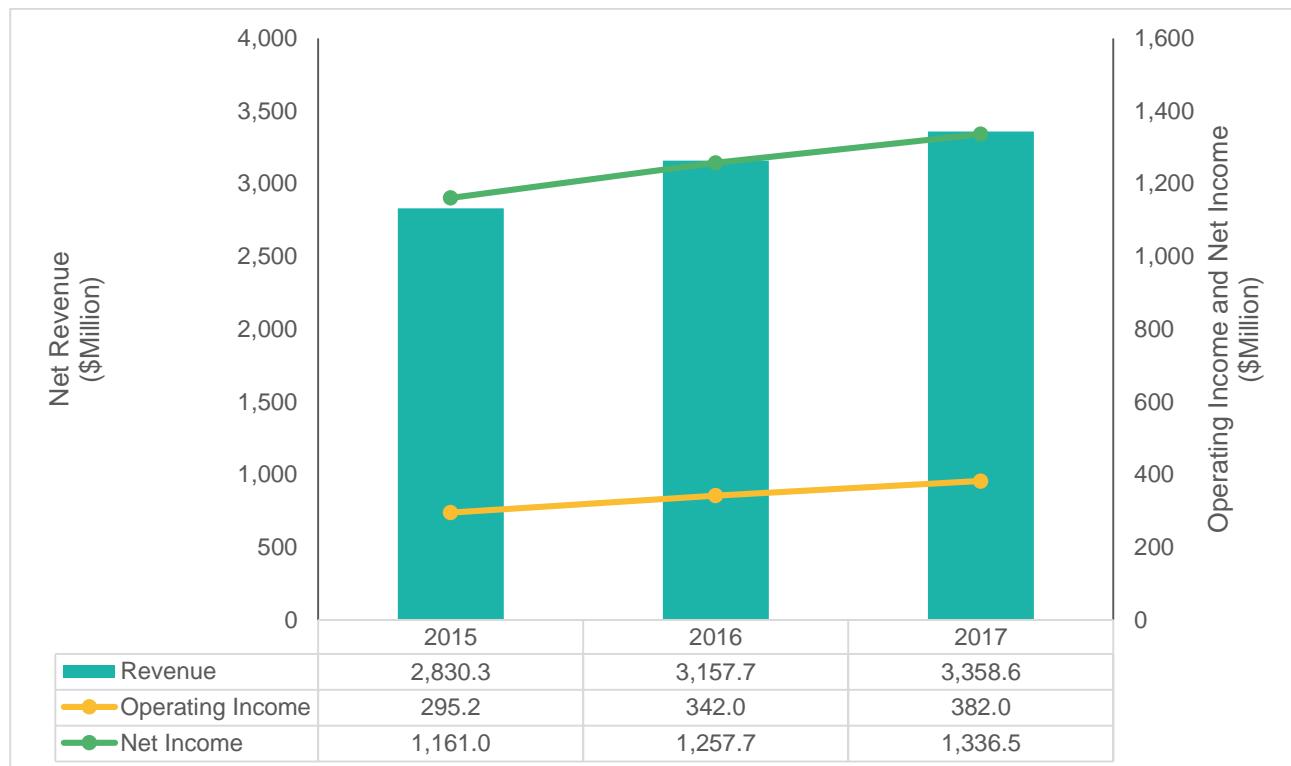
Source: Shimadzu Corporation Website and BIS Research Analysis

The company incorporates product launches as its key strategy to expand its product portfolio in the portable imaging solutions market. The significant product launches made by the company is

- The company launched MobileDaRt Evolution MX8 Version, MobileDaRt Evolution MX7 Version, and MobileDaRt Evolution EFX mobile X-ray systems in 2017, 2016, and 2015 respectively to increase their product offering in mobile X-rays systems market.

8.10.3 Financials

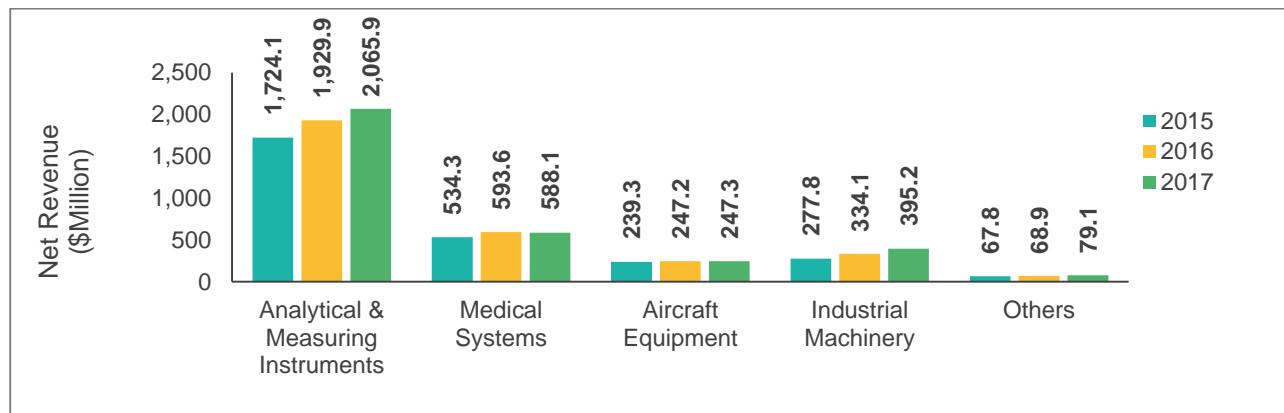
Figure: 8.52 Shimadzu Corporation - Overall Financials, 2015-2017



Source: Shimadzu Corporation Website and BIS Research Analysis

The financial year (FY) of the company starts from 1st April and ends on 31st March. The company generated a net revenue of \$3,358.6 million for the FY2017. The company reported a net increase of \$201.0 million or 6.37% in its revenue in FY2017 from FY2016, driven primarily by increased sales in all regions outside Japan, especially in China.

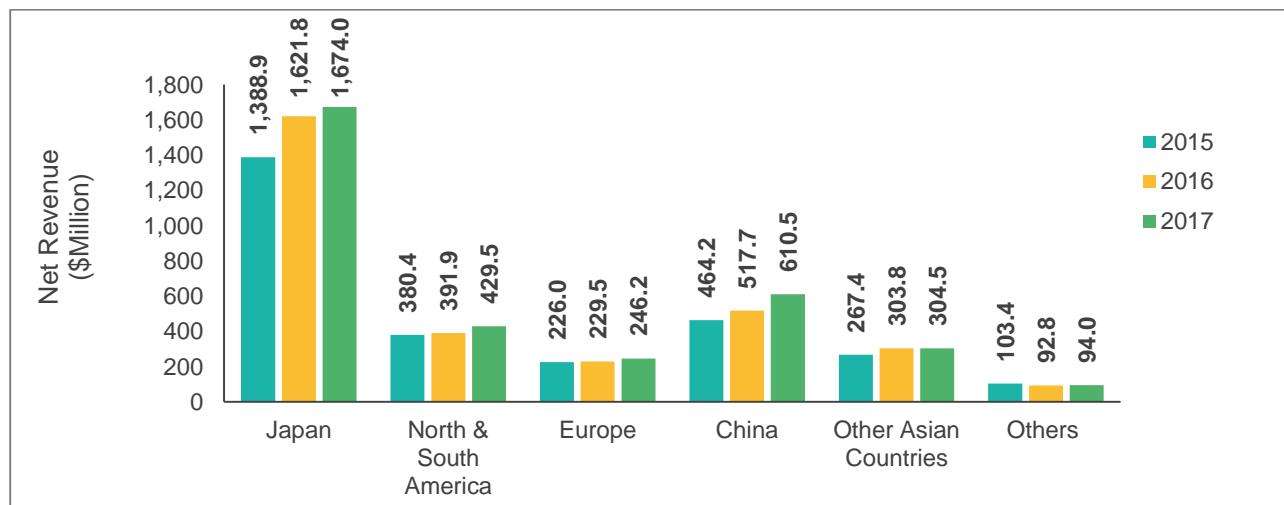
Further, company also reported a net increase of \$40 million or 11.70% in its operating income in FY2017 from FY2016, due to the further improvement in the profitability.

Figure: 8.53 Shimadzu Corporation - Revenue (by Segment), 2015-2017


Source: Shimadzu Corporation Website and BIS Research Analysis

The company reports its operations under four segments: Analytical & Measuring Instruments, Medical Systems, Aircraft Equipment, and Industrial Machinery. The Medical Systems segment generated a revenue of \$588.1 million in FY2017, reporting a decrease of 0.93% when compared with that of FY2016. This decrease was primarily attributable to the fluctuation in exchange currency rates.

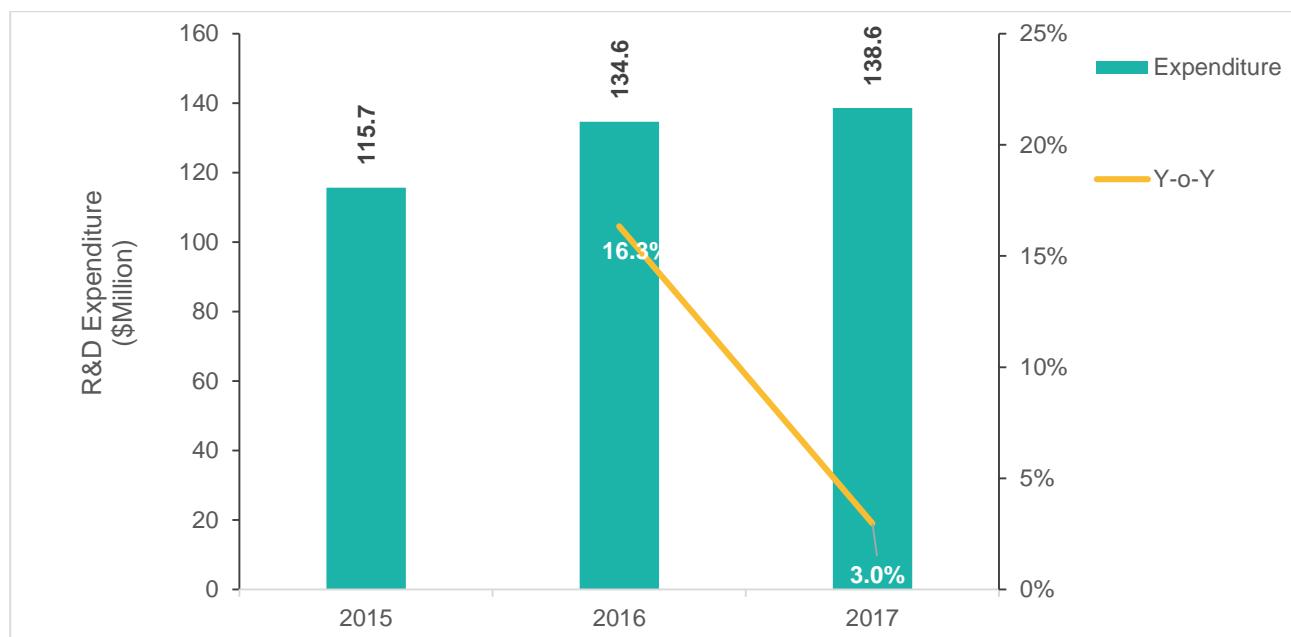
The Analytical & Measuring Instruments segment generated a revenue of \$2,065.9 million in FY2017, the Industrial Machinery segment generated a revenue of \$395.2 million in FY2017, and the Aircraft Equipment segment generated a revenue of \$247.3 million in FY2017.

Figure: 8.54 Shimadzu Corporation - Revenue (by Region), 2015-2017


Source: Shimadzu Corporation Website and BIS Research Analysis

The company reports its regional operations in six segments: Japan, North & South America, Europe, China, Other Asian Countries, and Others. The company generated 49.84% of its revenue for FY2017 from the Japan alone. As of FY2017, North & South America generated a revenue of \$429.5 million, reporting a rise of 17.07% from that of FY2016. The China generated a revenue of \$610.5 million in FY2017, reporting a rise of 25.98% from that of FY2016 whereas Europe generated a revenue of \$246.2 million in FY2017, reporting a rise of 14.61% from that of FY2016.

Figure: 8.55 Shimadzu Corporation - R&D Expenditure, 2015-2017



Source: Shimadzu Corporation Website and BIS Research Analysis

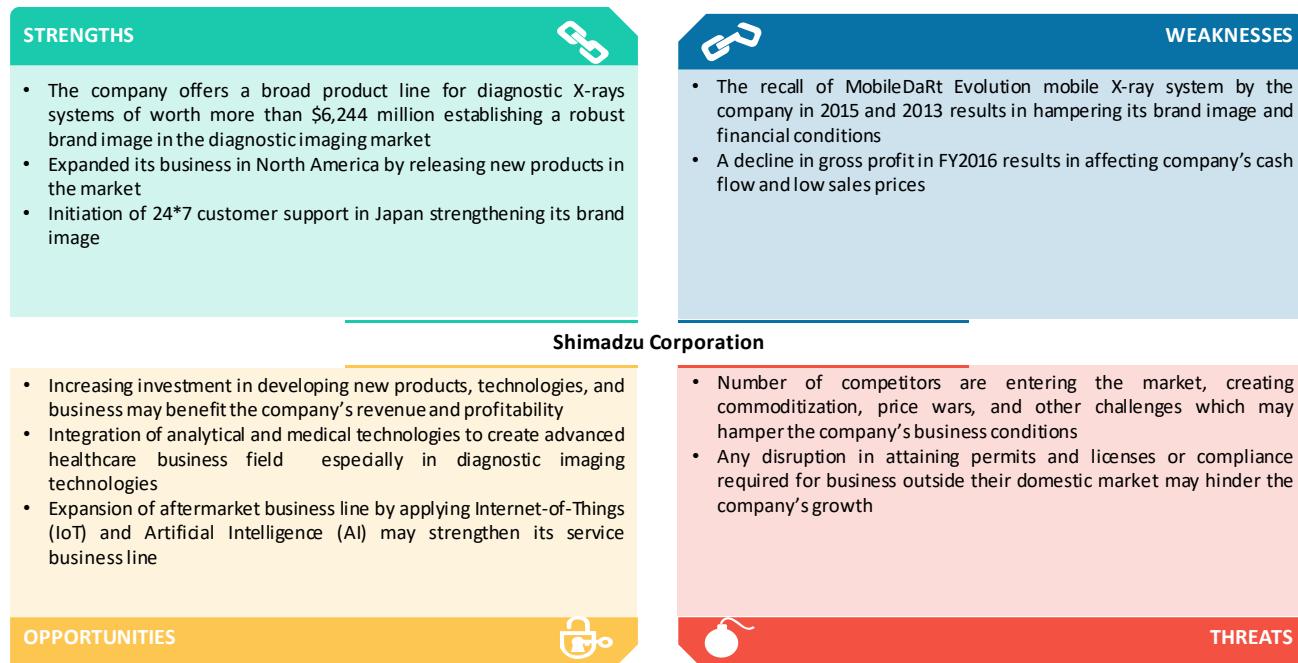
Shimadzu Corporation invests significantly in its research and development (R&D) with reported expenses of \$138.6 million in FY2017, \$134.6 million in FY2016, and \$115.7 million in FY2015. The company has over 6,549 granted patents in FY2017. Research is conducted for the development of new applications for the existing products and new products that would significantly increase the company's market share in its operable industries.



BIS Research

8.10.4 SWOT Analysis

Figure: 8.56 SWOT Analysis - Shimadzu Corporation



Source: BIS Research Analysis



8.11 Siemens Healthineers, Inc.

8.11.1 Company Overview

Particular	Specifications (as of FY2018)
Website	www.healthcare.siemens.com
Headquarters	Erlangen, Germany
Year of Establishment	1847 (Siemens AG)
Ownership Type	Public
Net Revenue	\$15,171.5 Million
Number of Employees	50,000
Subsidiaries	Siemens Spa (Algeria), Omnetric GmbH (Austria), Siemens Gebäudemanagement & Services GmbH (Australia), Polarion Software s.r.o. (Czech Republic), and Siemens W.L.L. (Bahrain), among others

Source: Siemens Healthineers, Inc. Website and BIS Research Analysis

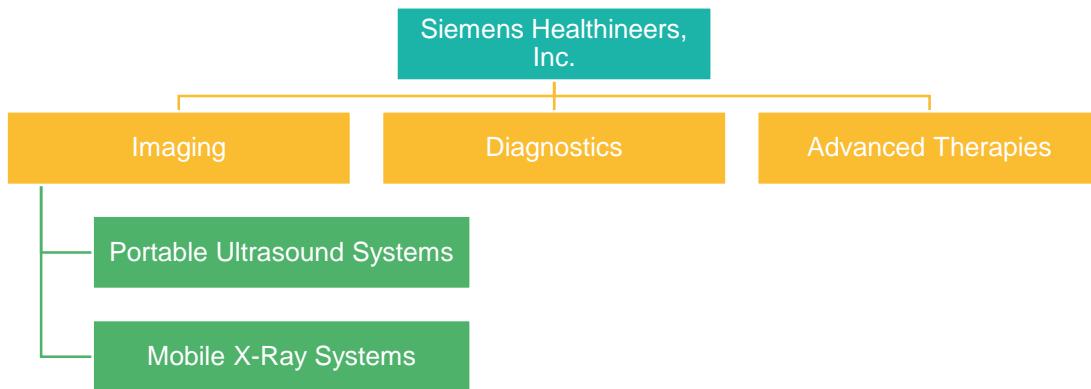
8.11.2 Role of Siemens Healthineers, Inc. in the Portable Imaging Solutions Market

Siemens Healthineers, Inc. is a manufacturer and provider of healthcare solutions and services. The company markets imaging, diagnostic, and advanced therapies products and services. In addition, company also provides clinical consulting services, supported by an extensive range of trainings and service offerings.

Catering to the portable imaging solutions market, company offers digital and analog mobile X-ray systems and portable ultrasound systems. Siemens Healthineers, Inc. accounted for an estimated share of 11.58% in the global market value in 2017. The company holds the second largest market share in 2017, attributed to the comprehensive portfolio that supports care continuum, ranging from prevention and early detection to diagnosis, treatment, and follow-up care.

Some of the leading competitors of the company contributing significantly to the portable imaging solutions market include General Electric Company, Konica Minolta, Inc., Shimadzu Corporation, and Samsung Electronics Co., Ltd., among others.

Figure: 8.57 Siemens Healthineers, Inc. - Product Portfolio for Portable Imaging Solutions Market



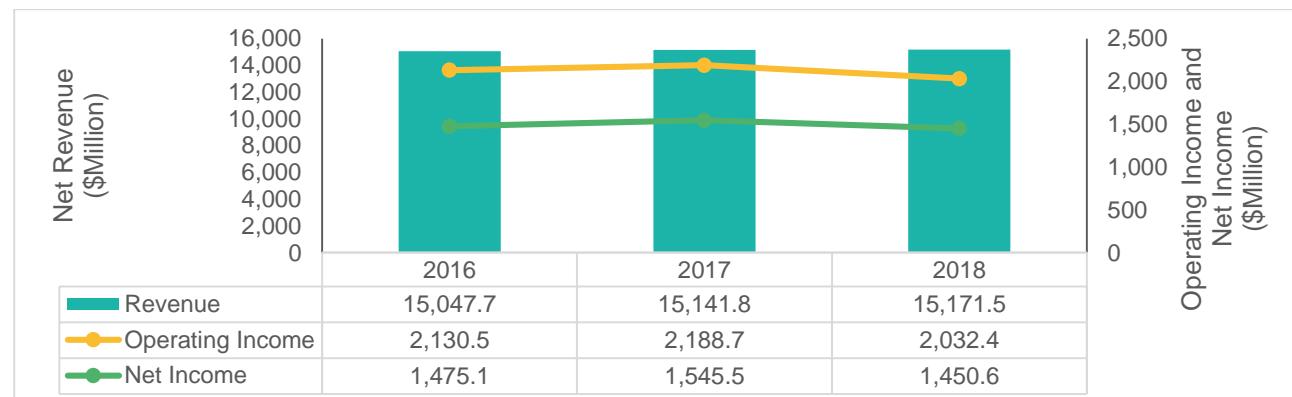
Source: Siemens Healthineers, Inc. Website and BIS Research Analysis

The company incorporates product launches as its key strategy to expand its product portfolio in the portable imaging solutions market. The significant product launches made by the company are:

- ACUSON Bonsai portable ultrasound system in 2018. The company launched ACUSON Bonsai portable ultrasound system for cardiovascular applications. The company collaborated with Mindray Medical International Limited to offer this product.
- MULTIMOBIL 10 mobile X-ray system in 2015. The company launched MULTIMOBIL 10, a mobile X-ray system. The system is equipped with high frequency technology to develop images at a low dose.

8.11.3 Financials

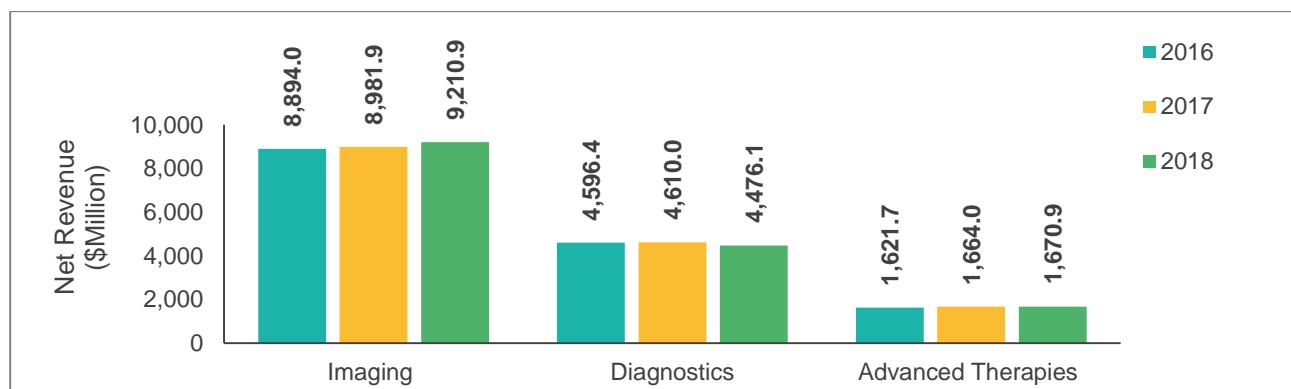
Figure: 8.58 Siemens Healthineers, Inc. - Overall Financials, 2016-2018



Source: Siemens Healthineers, Inc. Website and BIS Research Analysis

The financial year (FY) of the company starts from 1st October and ends on 30th September. The company generated a net revenue of \$15,171.5 million in FY2018. This revenue increased by 0.20% when compared with the \$15,141.8 billion revenue in FY2017. This revenue increase was primarily driven by the increased sales in Imaging and Advanced Therapies segments.

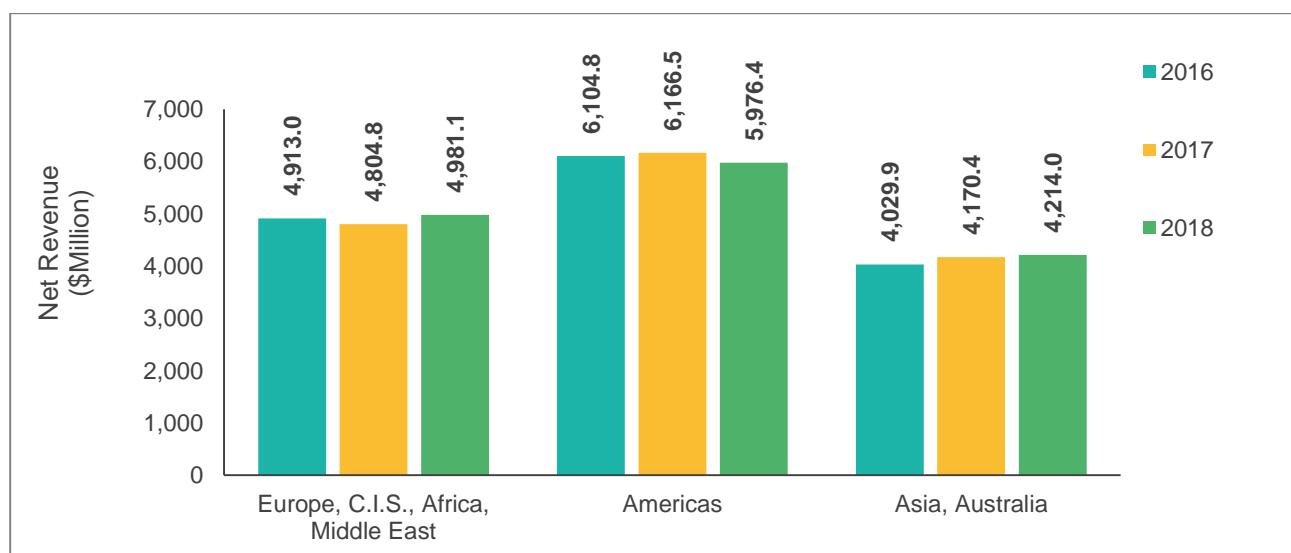
Figure: 8.59 Siemens Healthineers, Inc. - Revenue (by Segment), 2016-2018



Source: Siemens Healthineers, Inc. Website and BIS Research Analysis

The company operates under three divisions namely Imaging, Diagnostics and Advanced Therapies. The diagnostics segment witnessed a decline in the revenue of 2.90% in FY2018 than that of FY2017, generating a revenue of \$4,476.1 million in FY2017. As of FY2018, the revenue generated from the Imaging segment in 2018 is \$9,210.9 million, and the revenue generated from the Advanced Therapies segment was \$1,670.9 million in 2018.

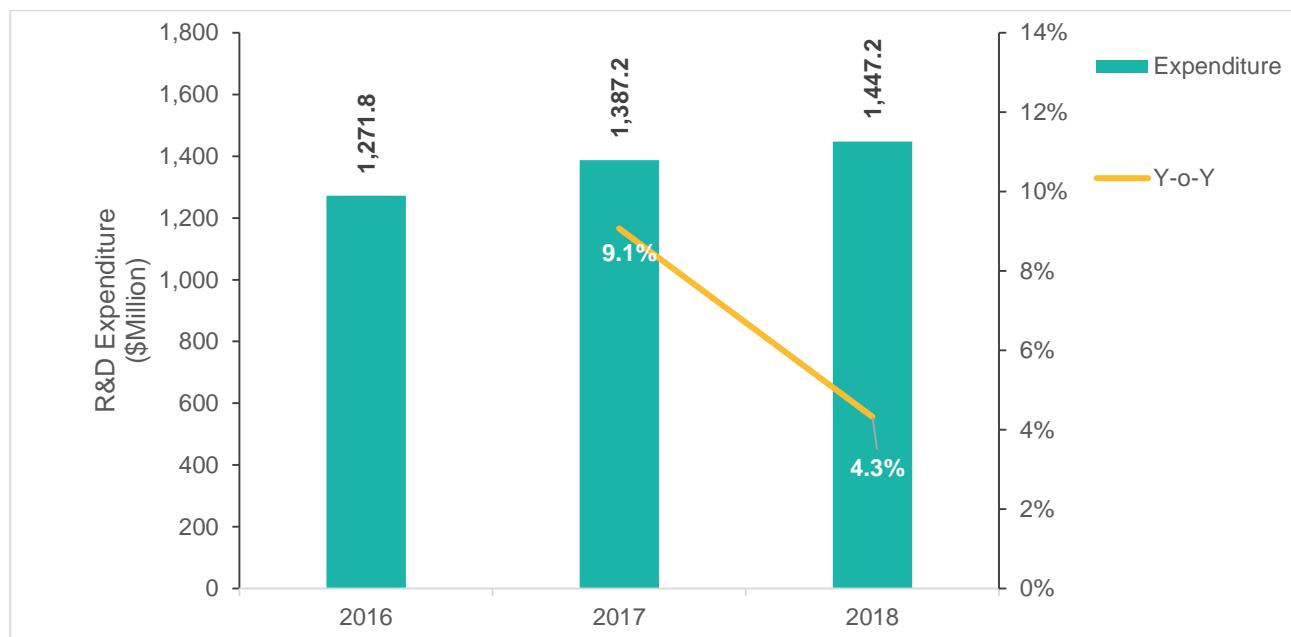
Figure: 8.60 Siemens Healthineers, Inc. - Revenue (by Region), 2015-2017



Source: Siemens Healthineers, Inc. Website and BIS Research Analysis

The company reports its revenues based on three regional segments, namely, the Americas, Europe, C.I.S., Africa, Asia, Australia. The Americas region was the leader in terms of revenue generation with net revenue of \$5,976.4 million in during FY2018, reporting a decline of 3.08% when compared with FY2017. This decline is attributed to the fluctuation in currency conversion rates. As of FY2018, the Europe, C.I.S., Africa, and Middle East regions collectively generated a revenue of \$4,981.1 million, while the Asia and Australia regions generated a revenue of \$4,214.0 million in 2017.

Figure: 8.61 Siemens Healthineers, Inc. - R&D Expenditure, 2015-2017



Source: Siemens Healthineers, Inc. Website and BIS Research Analysis

Siemens Healthineers, Inc. invests significantly in its research and development (R&D) with reported expenses of \$1,447.2 million in FY2018 and \$1,387.2 million in FY2017.

The Siemens AG has 63,000 and 59,800 granted patents in FY2017 and FY2016, respectively. Its R&D sector has 37,800 employees in FY2017.

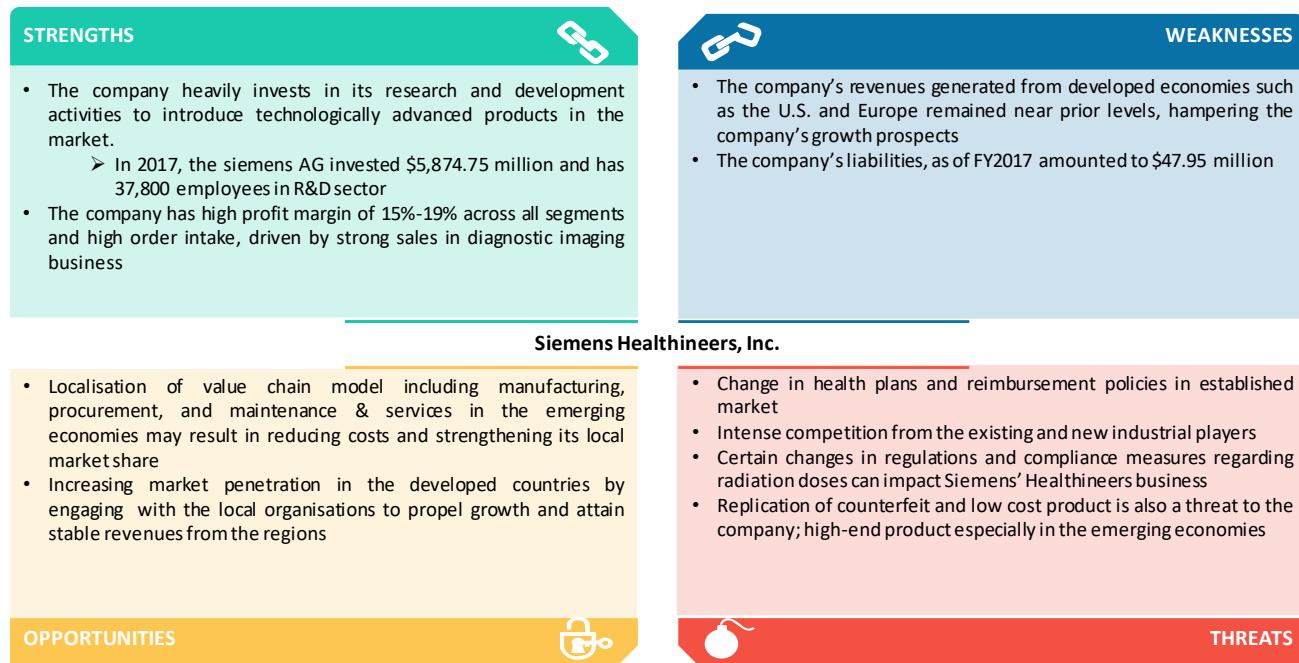


BIS Research

Global Portable Imaging Solutions Market

8.11.4 SWOT Analysis

Figure: 8.62 SWOT Analysis - Siemens Healthineers, Inc.



Source: BIS Research Analysis

8.12 Butterfly Network, Inc.

8.12.1 Company Overview

Particular	Specifications (as of FY2018)
Website	www.butterflynetwork.com
Headquarters	Connecticut, U.S.
Year of Establishment	2011
Ownership Type	Private
Number of Employees	111 (As per LinkedIn)
Competitors	Healcerion, Inc., Clarius Mobile Health Corp., Sonoscan, and BURL Concepts, Inc., among others

Source: *Butterfly Network, Inc. Website, LinkedIn, and BIS Research Analysis*

8.12.2 Role of Butterfly Network, Inc. in the Portable Imaging Solutions Market

Butterfly Network, Inc. is a provider of medical diagnostic imaging ultrasound system under the brand name of Butterfly iQ. The product ranges below \$2,000 to reduce the cost of 3 dimensional and real-time imaging. Recently, in October 2017, the company received 510(k) U.S. FDA approval for its Butterfly iQ, an ultrasound-on-a-chip based imaging system for iOS systems.



8.13 Carestream Health, Inc.

8.13.1 Company Overview

Particular	Specifications (as of FY2018)
Website	www.carestream.com
Headquarters	New York City, U.S.
Year of Establishment	2007
Ownership Type	Private
Number of Employees	4,794 (As per LinkedIn)
Subsidiaries	Carestream Health UK, Limited, Carestream Health Netherlands B.V. (Netherlands), Carestream Health Suisse SA (Spain), and Carestream Health India Pvt. Ltd., among others

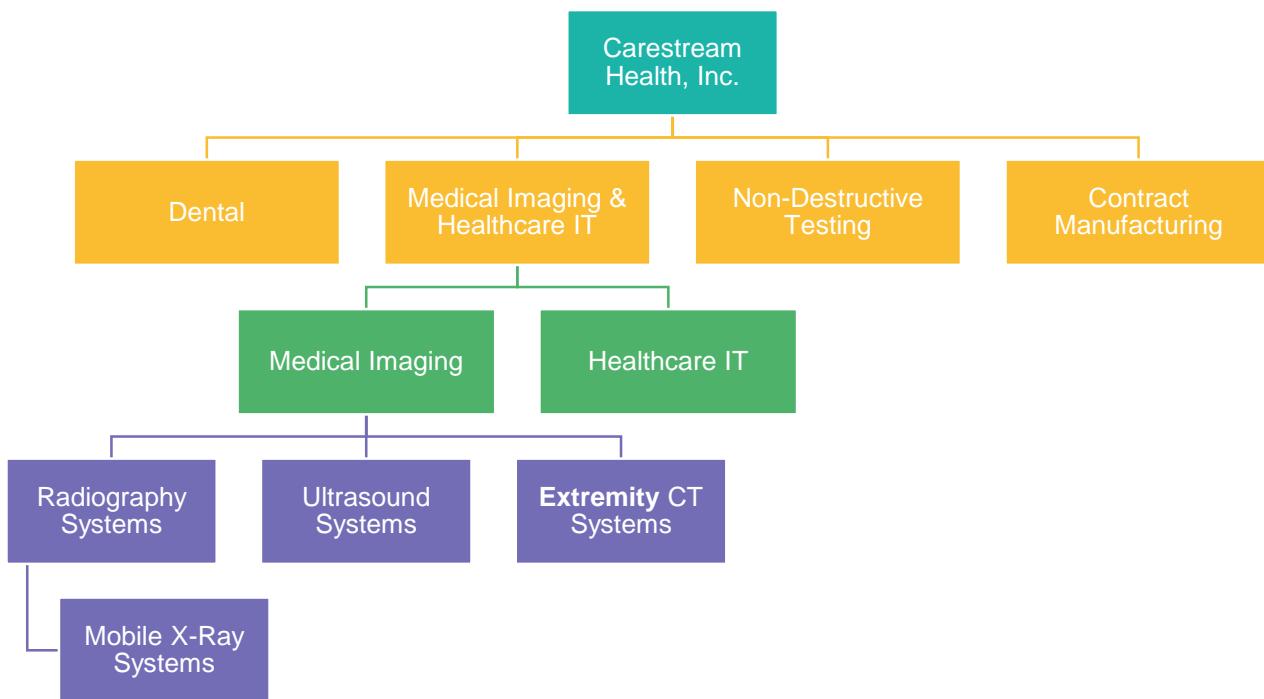
Source: Carestream Health, Inc. Website, LinkedIn, and BIS Research Analysis

8.13.2 Role of Carestream Health, Inc. in the Portable Imaging Solutions Market

Carestream Health, Inc. is a provider of healthcare IT and medical imaging systems. They also offer advanced materials for the precision films and electronics markets and X-ray imaging systems for non-destructive testing. Carestream is a part of Onex group of companies with more than 600 patents in information technology and medical imaging and operations in more than 160 countries. Company offer its products and services in medical imaging & healthcare IT, non-destructive testing, and contract manufacturing markets. Catering to the market, the company offers digital mobile X-ray systems. The company markets its products and services in more than 170 countries across the globe. Carestream Health, Inc. has three research and development (R&D) centers located in New York (U.S.), Genoa (Italy), and Shanghai (China).

Some of the leading competitors of the company contributing significantly to the portable imaging solutions market include General Electric Company, Siemens Healthineers, Inc., Minxray, Inc., Villa Sistemi Medicali Spa, MS Westfalia GmbH, Shimadzu Corporation, Hitachi, Ltd., and Fujifilm Holdings Corporation, among others.

Figure: 8.63 Carestream Health, Inc. - Product Portfolio for Portable Imaging Solutions Market



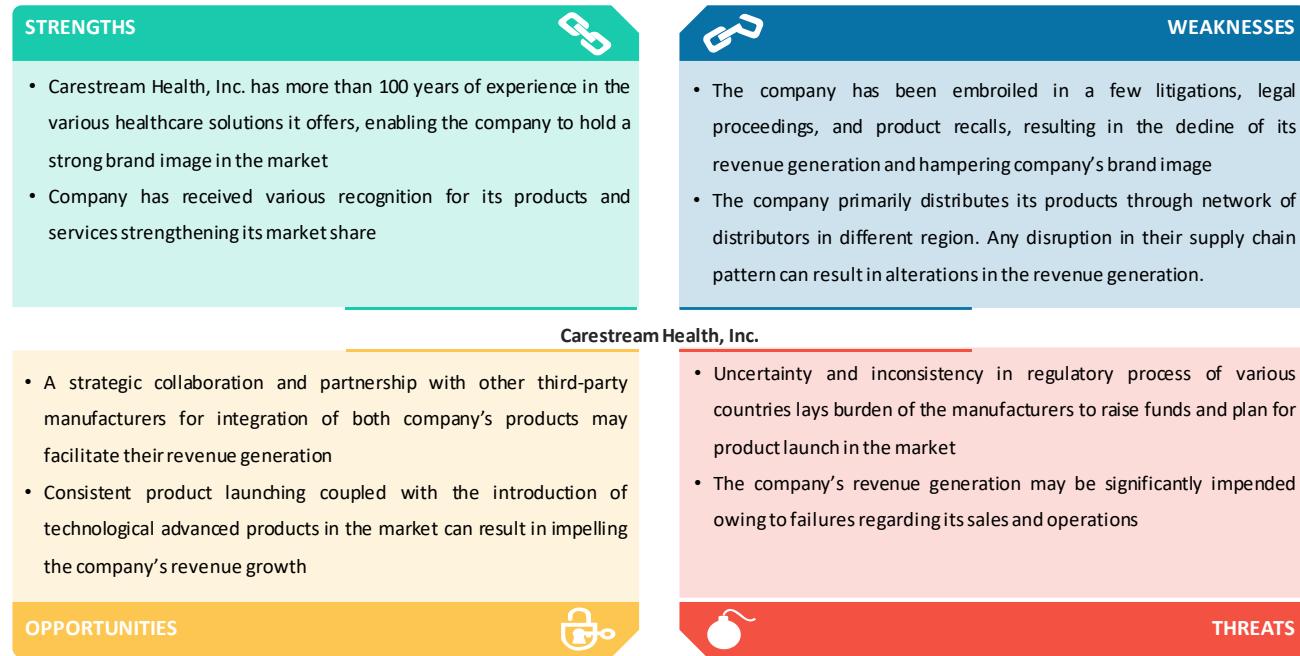
Source: Carestream Health, Inc. Website and BIS Research Analysis

The company incorporates product launches as its key strategy to expand its product portfolio in the portable imaging solutions market. The significant product launches made by the company is:

- In October 2016, the company launched DRX-Revolution Nano mobile X-ray system. The system is a non-motorized device that uses carbon nano-tube technology to reduce the size and weight of the product.

8.13.3 SWOT Analysis

Figure: 8.64 SWOT Analysis - Carestream Health, Inc.



Source: BIS Research Analysis

8.14 Clarius Mobile Health Corp.

8.14.1 Company Overview

Particular	Specifications (as of FY2018)
Website	www.clarius.com
Headquarters	Burnaby, Canada
Year of Establishment	2014
Ownership Type	Private
Number of Employees	50 (As per LinkedIn)

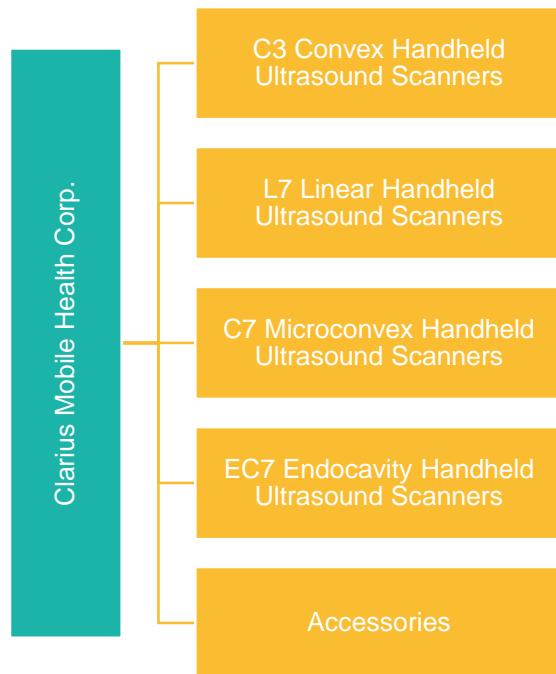
Source: Clarius Mobile Health Corp. Website and BIS Research Analysis

8.14.2 Role of Clarius Mobile Health Corp. in the Portable Imaging Solutions Market

Clarius Mobile Health Corp. designs, manufacturers, and markets handheld ultrasound scanners that connects via Bluetooth to iOS and Android tablets and smartphones. The products include C3 Convex handheld ultrasound scanners, L7 Linear handheld ultrasound scanners, C7 Microconvex handheld ultrasound scanners, and accessories. These products are intended for primary care, veterinary, emergency care, pain management, sports medicine, anesthesia, gynecology, reproductive medicine, breast, interventional, and clinical research applications. The company operates in more than 50 countries.

Some of the leading competitors of the company contributing significantly to the portable imaging solutions market include Sonoscan, Whale Imaging, Inc. EchoNous, Inc., Healcerion, Inc., Butterfly Network, Inc., and BURL Concepts, Inc., among others.

Figure: 8.65 Clarius Mobile Health Corp. - Product Portfolio for Portable Imaging Solutions Market



Source: Clarius Mobile Health Corp. Website and BIS Research Analysis

Clarius Mobile Health Corp. adopted product launches as its key strategy to expand its product portfolio in the portable imaging solutions market. The significant product launches made by the company are:

- In May 2018, the company launched Version 4 software for its handheld ultrasound systems. The features include pulsed wave doppler, DICOM modality worklist, and Viera breast ultrasound integration.
- In August 2017, the company launched Clarius App 3.1 Eclipse application. This application includes several additional features such as color/power doppler, partial compounding, and needle enhancement functions

8.15 EchoNous, Inc.

8.15.1 Company Overview

Particular	Specifications (as of FY2018)
Website	www.echonus.com
Headquarters	Washington, U.S.
Year of Establishment	2016
Ownership Type	Private
Number of Employees	46 (As per LinkedIn)

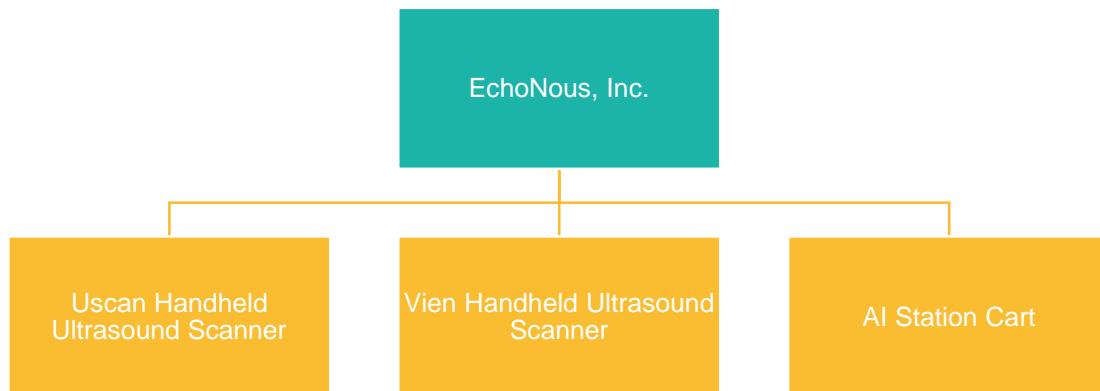
Source: EchoNous, Inc. Website, LinkedIn, and BIS Research Analysis

8.15.2 Role of EchoNous, Inc. in the Portable Imaging Solutions Market

EchoNous, Inc. is engaged in developing and marketing of handheld ultrasound systems for bladder and kidney care applications. The products include Uscan handheld ultrasound system, Vein handheld ultrasound system, and AI Station portable cart, among others. The company conducts its operations through its subsidiaries and distributors in Australia, U.S., New Zealand, and Japan.

Some of the leading competitors of the company contributing significantly to the portable imaging solutions market include Sonoscanner, Clarius Mobile Health Corp., Healcerion, Inc., General Electric Company, Koninklijke Philips N.V., Butterfly Network, Inc., and BURL Concepts, Inc., among others.

Figure: 8.66 EchoNous, Inc. - Product Portfolio for Portable Imaging Solutions Market



Source: EchoNous, Inc. Website and BIS Research Analysis

EchoNous, Inc. adopted product launches as its key strategy to expand its footprints in the international market. The significant product launches made by the company is:

- In July 2018, the company launched Uscan handheld ultrasound system in the U.S. market for kidney examinations, image urological catheter, and wall thickness measurement applications.



8.16 Esaote SpA

8.16.1 Company Overview

Particular	Specifications (as of FY2018)
Website	www.esaote.com
Headquarters	Genoa, Italy
Year of Establishment	1980
Ownership Type	Private
Net Revenue	\$311.1 million (31 st December 2015)
Number of Employees	1,250 (2016)
Subsidiaries	Esaote North America Inc. (U.S.), Esaote España S.A. (Spain), Esaote Biomedica Deutschland GmbH (Germany), and Esaote France S.A.R.L., among others

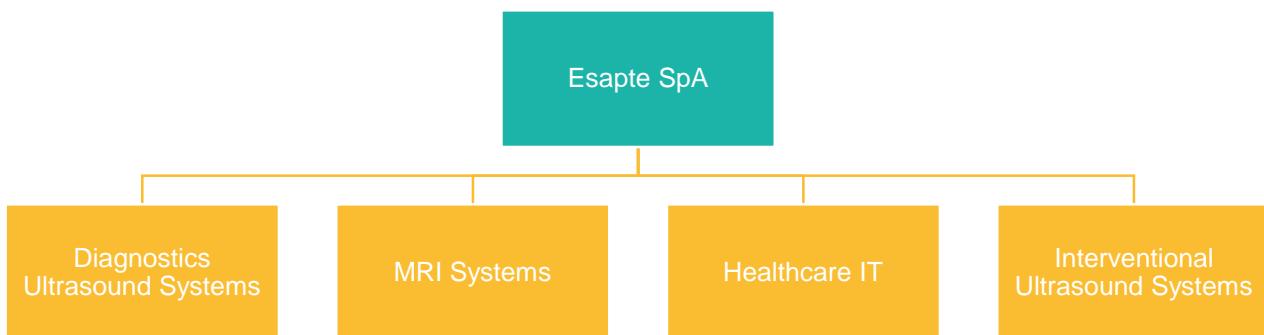
Source: *Esaote SpA Website and BIS Research Analysis*

8.16.2 Role of Esaote SpA in the Portable Imaging Solutions Market

Esaote SpA is a manufacturer of medical diagnostic systems and offers Information Technology services for the healthcare domain. The company provides diagnostic ultrasound systems, accounted for nearly 60% of the total sales, magnetic resonance imaging systems, interventional imaging systems, and healthcare IT services for both veterinary and human applications. The company was formed through the merger of ESA Group (Elsag-Selenia-Ansaldo) and OTE (Officine Toscane Elettromeccaniche) Biomedica. The company has filed more than 120 international patents. Catering to the portable imaging solutions market, the company offers three portable ultrasound systems.

The company's research & development (R&D) facilities are located in Genoa, Florence and Naples (Italy), Maastricht (The Netherlands), Shenzhen (China). The company conducts its international operations in more than 60 countries through the diverse network of subsidiaries in the U.S., China, Germany, Netherlands, Argentina, Spain, France, Brazil, Russia, and India.

The company's competitors that cater to the market include Clarius Mobile Health Corp., eZono AG, Echo Control Medical, EchoNous, Inc., Mobisante, Inc., and Shenzhen Landwind Industry Co., Ltd., among others.

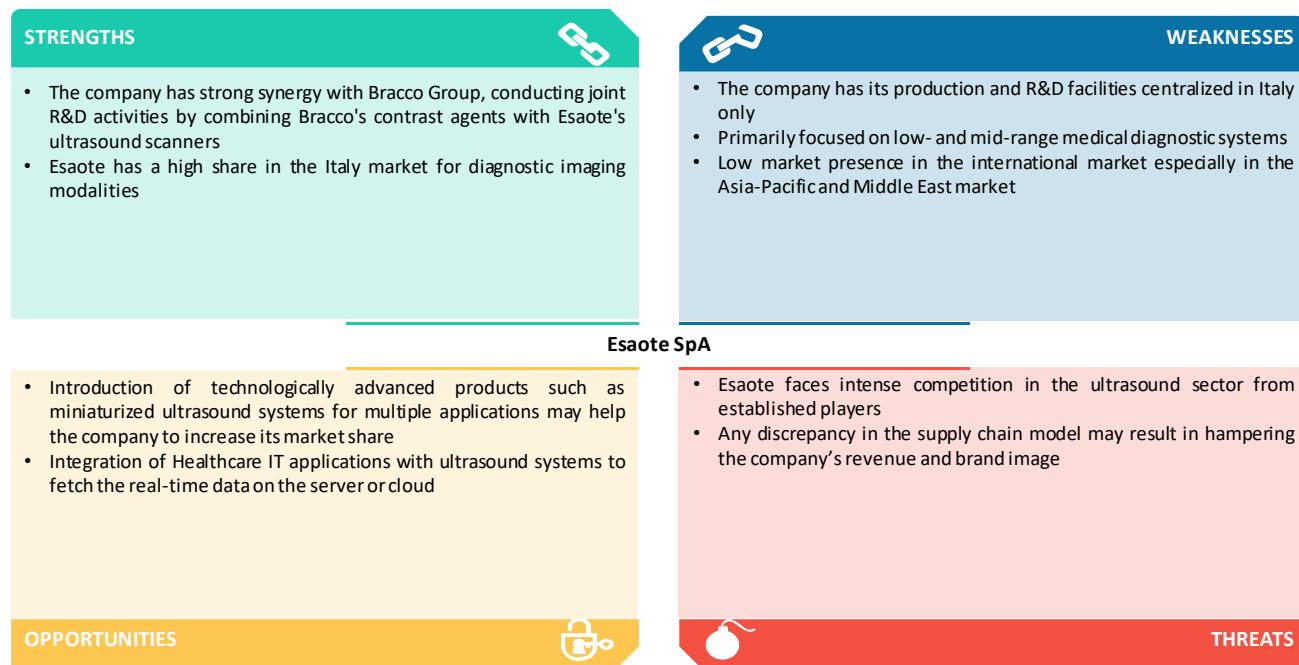
Figure: 8.67 Esaote SpA - Product Portfolio for Portable Imaging Solutions Market

Source: Esaote SpA Website and BIS Research Analysis

In April 2018, the company's capital share has been acquired by Consortium of Chinese investors. This consortium is composed Yunfeng Capital (investment group), Shanghai FTZ Fund (Free Trade Zone fund), Yuwell-Jiangsu Yuyue medical equipment & supply Co., Ltd. (homecare medical equipment manufacturer), Tianyi (investment group), Kangda (OEM manufacturer), and Wandong (medical device manufacturer). Through this acquisition, the company will work as an independent organization, and will use diverse distribution network of new stakeholders along with the growth opportunity to enter in the China market.

8.16.3 SWOT Analysis

Figure: 8.68 SWOT Analysis - Esaote SpA



Source: BIS Research Analysis

8.17 Healcerion, Inc.

8.17.1 Company Overview

Particular	Specifications (as of FY2018)
Website	www.healcerion.com
Headquarters	Seoul, South Korea
Year of Establishment	2012
Ownership Type	Private
Number of Employees	19 (As per LinkedIn)

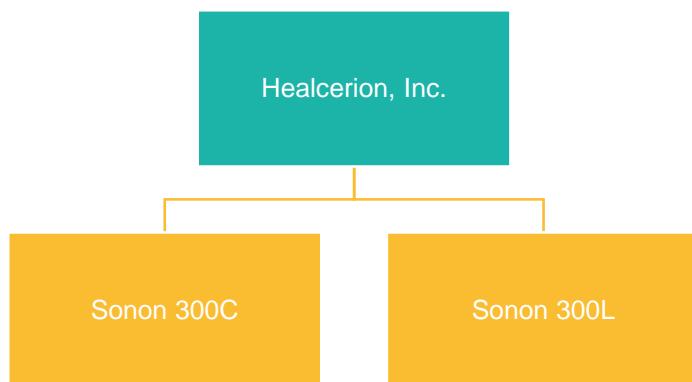
Source: Healcerion, Inc. Website, LinkedIn, and BIS Research Analysis

8.17.2 Role of Healcerion, Inc. in the Portable Imaging Solutions Market

Healcerion, Inc. is a manufacturer of mobile-based ultrasound systems for emergency medicine and other medical applications. The company offers 2 diagnostic ultrasound systems: Sonon 300L for thyroid, carotid, breast, musculoskeletal, vascular, superficial, and lungs applications; and Sonon 300C for abdominal, bladder, and obstetrician/gynecology applications. These products feature compact design, wireless connectivity, and compatibility with picture archiving and communication system (PACS).

The company's competitors that cater to the portable imaging solutions market include Clarius Mobile Health Corp., Sonoscan, Koninklijke Philips N.V., Butterfly Network, Inc., and BURL Concepts, Inc., among others.

Figure: 8.69 Healcerion, Inc. - Product Portfolio for Portable Imaging Solutions Market



Source: Healcerion, Inc. Website and BIS Research Analysis

Healcerion, Inc. seeks product approvals and launches as its key strategy to expand its footprints in the international market. The significant product launches made by the company is:

- In November 2017, the company received 510(k) U.S. FDA approval for its SONON 300L handheld ultrasound system. The system is a wireless, app-based ultrasound device weighing less than 370 grams.



8.18 Mindray Medical International Limited

8.18.1 Company Overview

Particular	Specifications (as of FY2017)
Website	www.mindray.com
Headquarters	Shenzhen, China
Year of Establishment	1991
Ownership Type	Private
Number of Employees	7,600
Subsidiaries	Mindray Medical Australia Ltd., Comércio e Distribuição de Equipamentos Médicos Ltda. (Brazil), Mindray Medical Canada Ltd., Mindray Medical Colombia S.A.S., and Mindray Medical Vietnam Co., Ltd., among others

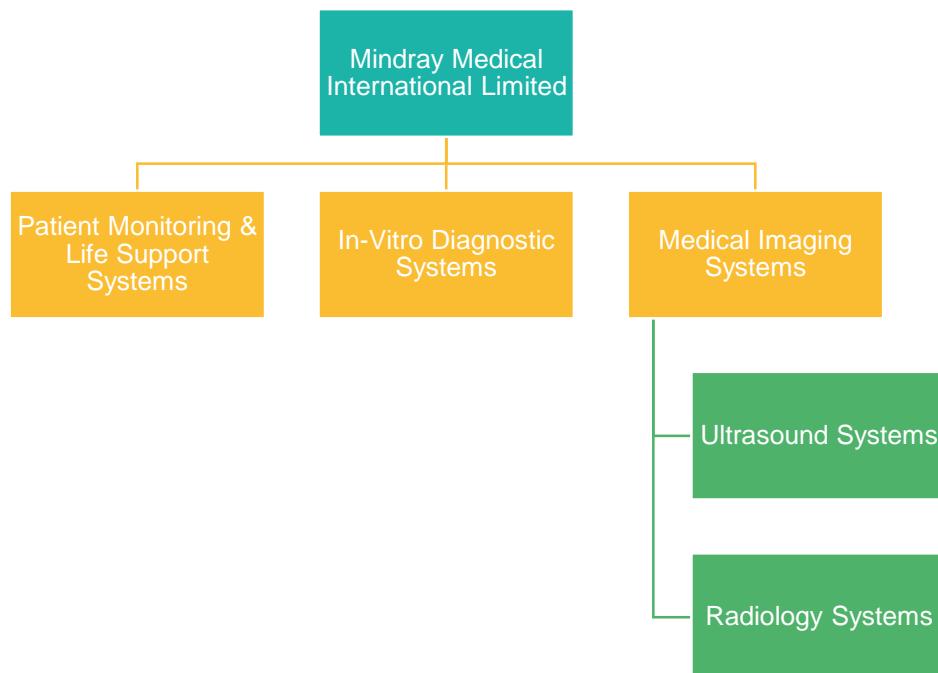
Source: *Mindray Medical International Limited Website and BIS Research Analysis*

8.18.2 Role of Mindray Medical International Limited in the Portable Imaging Solutions Market

Mindray Medical International Limited is a medical devices and solutions provider. The company offers medical imaging systems, in-vitro diagnostic products, patient monitoring & life support systems for both human and veterinary applications. Mindray markets their products through the network of subsidiaries and branch offices in more than 39 countries in North America, Latin America, Asia-Pacific, Europe, and Africa regions. Company invests nearly 10% of total annual revenue on its research and development activities. The company conducts its operations in more than 190 countries with the network of subsidiaries and branch offices in 39 countries. They also have 7 research and development centers in China and U.S.

Catering to the portable imaging solutions market, the company offers a diverse range of portable ultrasound systems for different applications. The company's competitors that cater to the portable imaging solutions market include Analogic Corporation, Shenzhen Landwind Industry Co., Ltd., Echo Control Medical, Clarius Mobile Health Corp., EchoNous, Inc., and Mabisante, Inc., among others.

Figure: 8.70 Mindray Medical International Limited - Product Portfolio for Portable Imaging Solutions Market



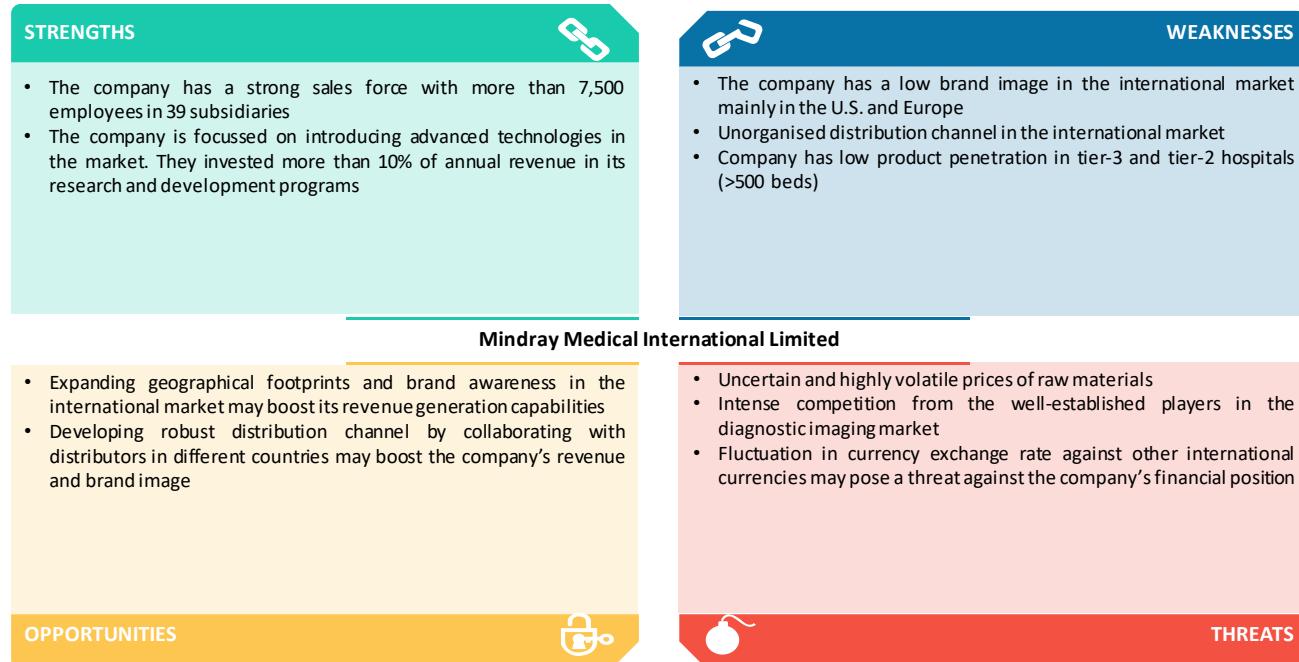
Source: Mindray Medical International Limited Website and BIS Research Analysis

The company incorporates product launches as its key strategy to expand its product portfolio in the portable imaging solutions market. The significant product launches made by the company are:

- In August 2016, the company launched M6 portable ultrasound system. The system offers advanced clinical functions and intelligent measurement tools for accurate ultrasound scanning.
- In March 2015, the company launched TE7 portable color doppler ultrasound system for radiology and general applications.

8.18.3 SWOT Analysis

Figure: 8.71 SWOT Analysis - Mindray Medical International Limited



Source: BIS Research Analysis

8.19 Teratech Corporation

8.19.1 Company Overview

Particular	Specifications (as of FY2017)
Website	www.terason.com
Headquarters	Massachusetts, U.S.
Year of Establishment	1994
Ownership Type	Private
Number of Employees	79 (As per LinkedIn)

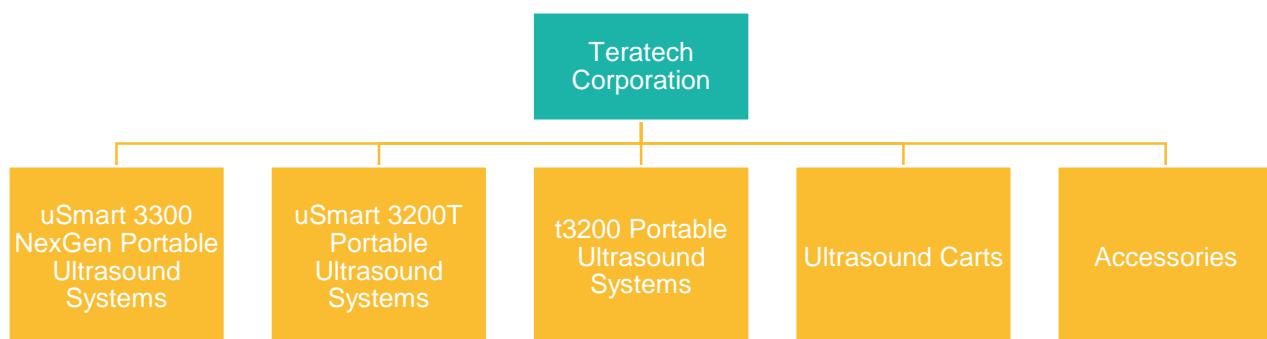
Source: Teratech Corporation Website, LinkedIn, and BIS Research Analysis

8.19.2 Role of Teratech Corporation in the Portable Imaging Solutions Market

Teratech Corporation designs, manufacturers, and markets diagnostic ultrasound systems. The company offers uSmart 3300 NexGen, uSmart 3300T NexGen, and t3200 portable ultrasound systems for breast, musculoskeletal, phlebology, vascular, endocrinology, anesthesia, cardiology, and critical care applications, among others. They also offer ultrasound accessories such as mobile cart, thermal printers, and flash drives, among others.

The company's competitors that cater to the portable imaging solutions market include Clarius Mobile Health Corp., Sonoscan, General Electric Company, Koninklijke Philips N.V., Butterfly Network, Inc., and BURL Concepts, Inc., among others.

Figure: 8.72 Teratech Corporation - Product Portfolio for Portable Imaging Solutions Market



Source: Teratech Corporation Website and BIS Research Analysis



8.20 Whale Imaging, Inc.

8.20.1 Company Overview

Particular	Specifications (as of FY2017)
Website	www.whaleimaging.com
Headquarters	Massachusetts, U.S.
Year of Establishment	1998
Ownership Type	Private
Number of Employees	23 (As per LinkedIn)

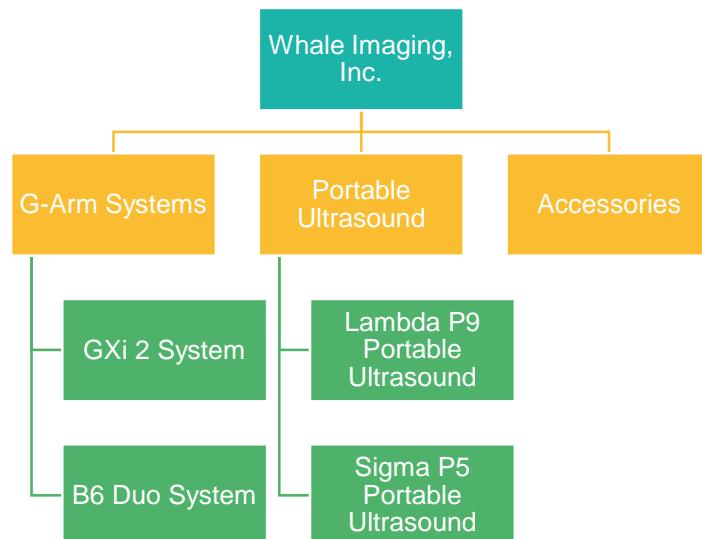
Source: *Whale Imaging, Inc. Website, LinkedIn, and BIS Research Analysis*

8.20.2 Role of Whale Imaging, Inc. in the Portable Imaging Solutions Market

Whale Imaging, Inc. is medical device manufacturer offering portable diagnostic ultrasound systems and multi-planar surgical imaging systems. The company offers two portable ultrasound systems and two G-Arm X-ray systems along with accessories.

The company's competitors that cater to the portable imaging solutions market include Clarius Mobile Health Corp., Sonoscan, Butterfly Network, Inc., BURL Concepts, Inc., and Echo Control Medical, among others.

Figure: 8.73 Whale Imaging, Inc. - Product Portfolio for Portable Imaging Solutions Market



Source: *Whale Imaging, Inc. and BIS Research Analysis*

The company incorporates product launches as its key strategy to expand its product portfolio in the portable imaging solutions market. The significant product launches made by the company are:

- In June 2017, the company launched Lambda P9 portable ultrasound system for cardiovascular applications.
- In September 2016, the company launched Sigma P5 portable ultrasound system for general applications such as musculoskeletal, pain management, anesthesiology, and vascular.



8.21 Xoran Technologies, LLC

8.21.1 Company Overview

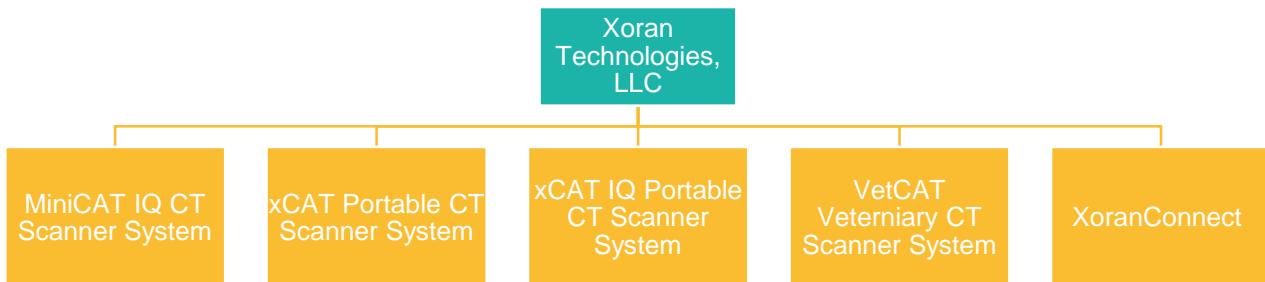
Particular	Specifications (as of FY2017)
Website	www.xorantech.com
Headquarters	Michigan, U.S.
Year of Establishment	2001
Ownership Type	Private
Number of Employees	69 (As per LinkedIn)

Source: Xoran Technologies, LLC website, LinkedIn, and BIS Research Analysis

8.21.2 Role of Xoran Technologies, LLC in the Portable Imaging Solutions Market

Xoran Technologies, LLC is a Computed Tomography (CT) scanner systems and solutions providers. The company was founded by two research scientists from University of Michigan, U.S. and have an installed base of approximately 500 CT scanner systems on the global level. The product line includes xCAT mobile CT scanner, MiniCAT in-office CT scanner, and XoranConnect (web-based image viewing tool). Samsung Electronics Co., Ltd. The company's competitors include Samsung Electronics Co., Ltd. in the portable CT scanners market.

Figure: 8.74 Xoran Technologies, LLC - Product Portfolio for Portable Imaging Solutions Market



Source: *Xoran Technologies, LLC website and BIS Research Analysis*

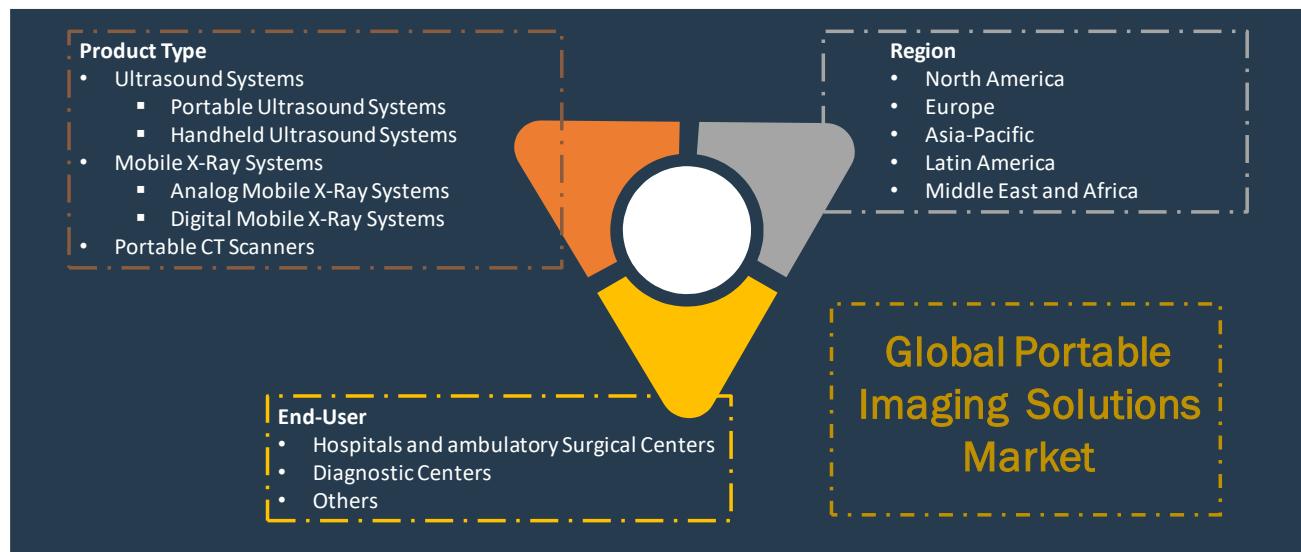
The company adopted partnership as a key strategy to gain market share and expand its footprints into the market. The company has signed a partnership agreement with Acclarent, Inc. (Johnson & Johnson Company), Association of Otolaryngology Administrators, U.S., Entellus Medical, Inc. (Stryker Corporation), Fiagon GmbH, Fuel Medical Group, and Highland Capital Corporation.

9. Research Scope and Methodology

9.1 Report Scope

The report constitutes of an in-depth study of the global portable imaging solutions market, including a thorough analysis of the products and services across different regions. The study represents a detailed analysis of the market trends and the market size for the time period of 2017 to 2028, wherein 2017 is the base year and the years from 2018 to 2028 constitute of the forecast period. The report covers all the prevalent trends which are expected to play a major role in the growth of the market over the forecast period. It also highlights various drivers, restraints, and opportunities which are expected to influence the market's growth during the forecast period. The scope of this report is focused on the global portable imaging solutions market, products, their market dynamics, growth prospect mapping, SWOT analysis, Porter's Five Forces, and country-wise analysis.

The study provides a holistic perspective on the market growth in terms of revenue estimates across different regions which include North America, Europe, Asia-Pacific (APAC), Latin America and Middle East & Africa. The report provides cross-sectional analysis of the global portable imaging solutions market in terms of market estimates and projections for different product types across different countries. The regions have been further segmented to cover the in-depth country level analysis. The North American region has been segmented into the U.S. and Canada. Similarly, Europe has been further segmented into the U.K., Germany, France, Italy, Spain, Russia, Nordic Countries, BENELUX countries, and Rest-of-Europe; Asia-Pacific has been segmented into China, Japan, Australia & New Zealand, India, South Korea, and Rest-of-Asia-Pacific, Latin America has been segmented into Mexico, Brazil, Argentina, Colombia, and Rest-of-Latin America; and Middle East & Africa has been segmented into KSA, U.A.E, South Africa, and Rest-of-Middle East & Africa. The revenue estimates for these countries has also been included in the report. The following figure illustrates the approaches through which the global portable imaging solutions market is analyzed.

Figure: 9.1 Global Portable Imaging Solutions Market


9.2 Global Portable Imaging Solutions Market: Research Methodology

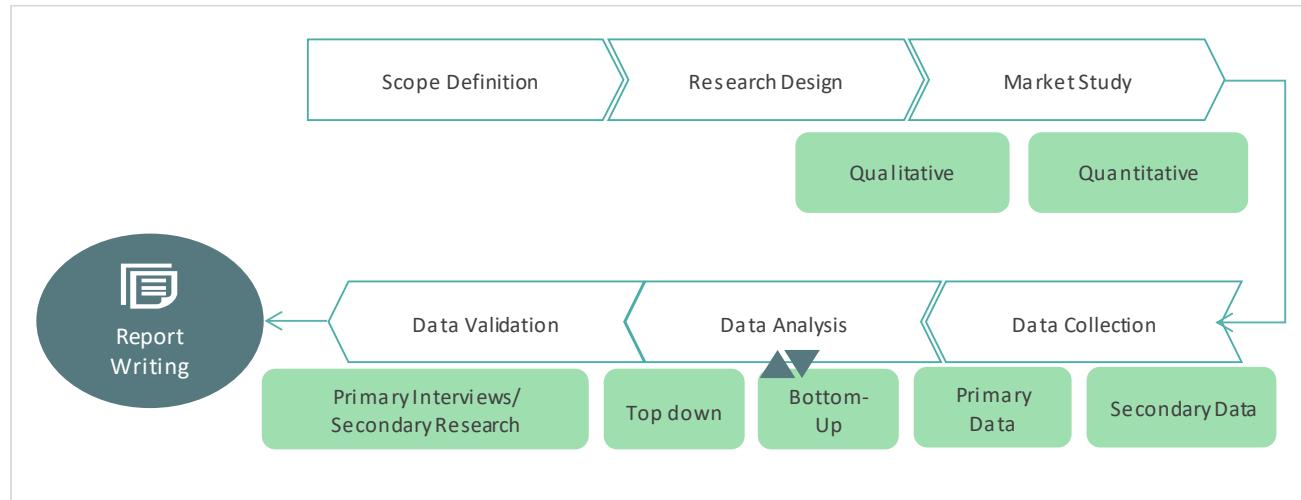
The research methodology was an efficient combination of primary and secondary research. For secondary research, the analysts referred to several articles, blogs, white papers, journals, websites, and documents related to the portable imaging solutions market. They also reviewed product literature, press releases, and annual reports of the key market players (public listed companies). As a part of the primary research, they conducted in-depth views with a wide range of eminent industry participants and key opinion leaders, which helped in understanding several facts of the market with respect to the products.

The market size of portable imaging solutions in terms of \$million for the year 2016 and 2017 was estimated by using a top-down approach. This approach involved the estimation of the market revenue for each product and their summation in order to arrive at the total global number. For estimating the market size of different products, the global sales of portable imaging systems, were calculated. For calculating the value of portable imaging solutions in a year, the company's annual reports, press releases, blogs, articles, and white papers were referred to and the key opinion leaders with significant experience in this market segment were contacted. While estimating the market growth for each product, over the forecast period from 2018 to 2028, factors such as the developer's regional presence, partnerships and collaborations, test and drug development processes, and approvals were considered.

The portable imaging solutions for which no real-time data was available in the public domain, personnel from the respective companies were contacted in order to gain valuable information pertaining to the product in different regions and their corresponding price. This information was then used to estimate the global number for a particular product, which was later validated by the industry

experts. The market value may vary from 5-7%, as the data has been collected from different sources at the regional and country level.

Figure: 9.2 Global Portable Imaging Solutions Market: Research Methodology

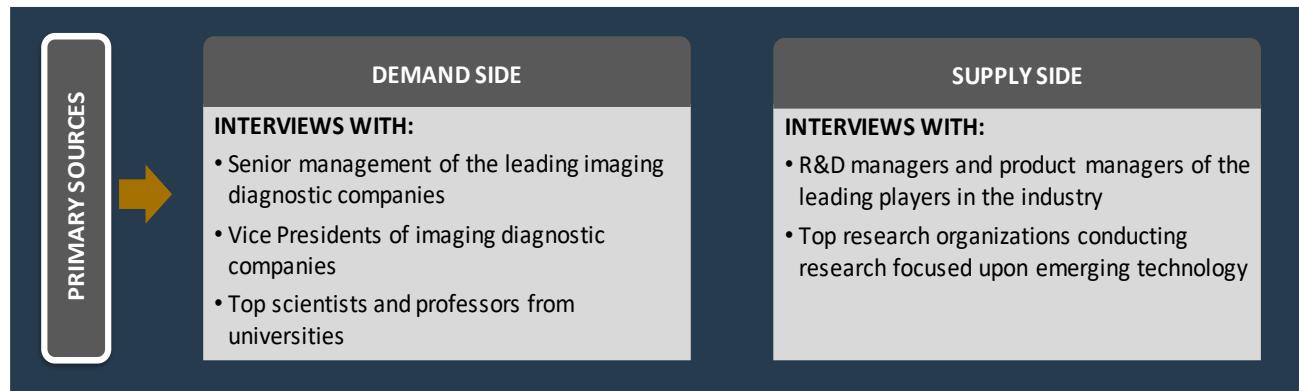


9.2.1 Primary Data Sources

The primary sources involve the industry experts from the portable imaging solutions industry including the suppliers, component manufacturers, device manufacturers, and distributors, among others. The resources such as CEOs, vice presidents, marketing directors, and technology and innovation directors, among others, have been interviewed to obtain and verify both qualitative and quantitative aspects of this research study.

The key data points taken from the primary sources include:

- Validation and triangulation of all the numbers and graphs
- Validation of report's segmentation and key qualitative findings
- Understanding the competitive landscape
- Validation of the numbers of the different segments of the market in focus
- Percentage split of individual markets for regional analysis
- Current market scenario along with its key trends and dynamics

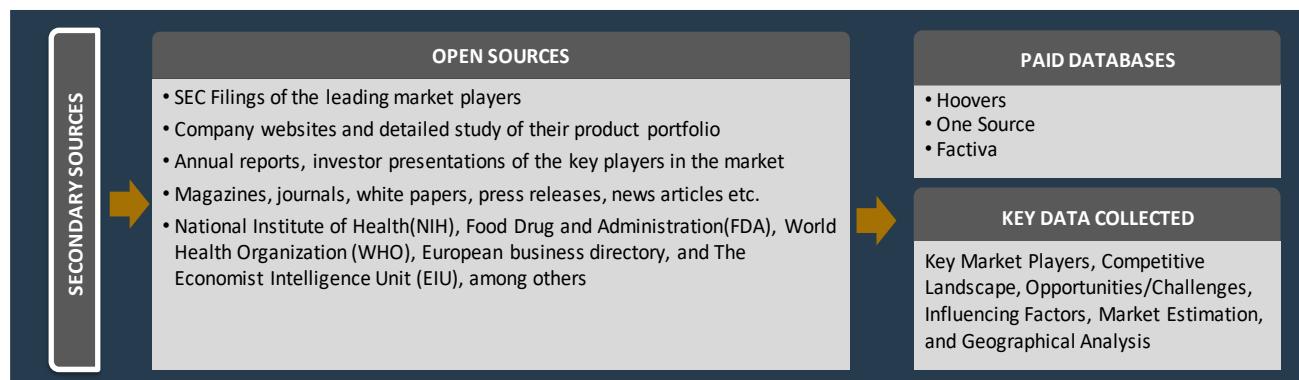
**Figure: 9.3 Primary Research**

9.2.2 Secondary Data Sources

The research study involves the usage of extensive secondary sources such as databases, company websites, and annual reports. The following figure exhibits the key secondary data sources that have been considered in this research study:

The key data points taken from the secondary sources include:

- Segmentation breakups, split-ups, and percentage shares
- Data for market value
- Key industry trends of the top players of the market
- Qualitative insights into various aspects of the market, key trends, and emerging areas of innovation
- Quantitative data for mathematical and statistical calculations

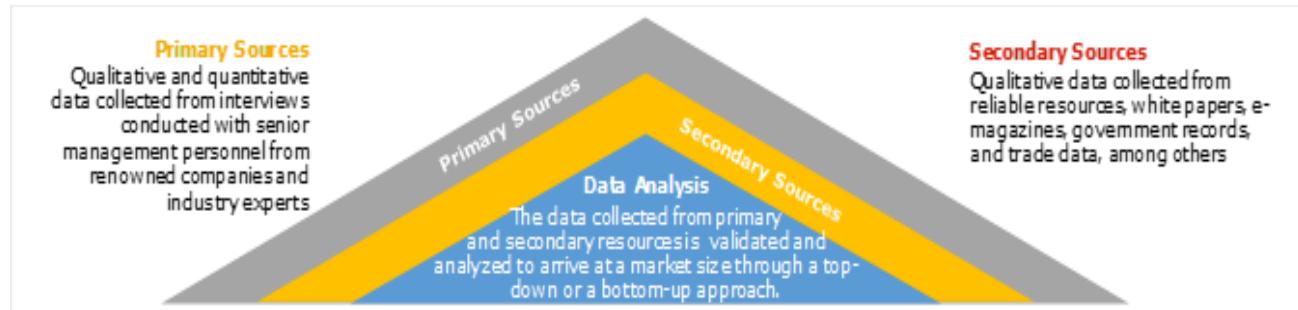
Figure: 9.4 Secondary Research



9.2.3 Data Triangulation

The following figure exhibits the data triangulation that have been considered:

Figure: 9.5 Data Triangulation



The main task for a thorough analysis of the global portable imaging solutions market was to identify the set of underlying factors affecting the growth of the market. The following figure exhibits the detailed methodology adopted for estimating the potential of global portable imaging solutions market:

Figure: 9.6 Bottom-Up Approach

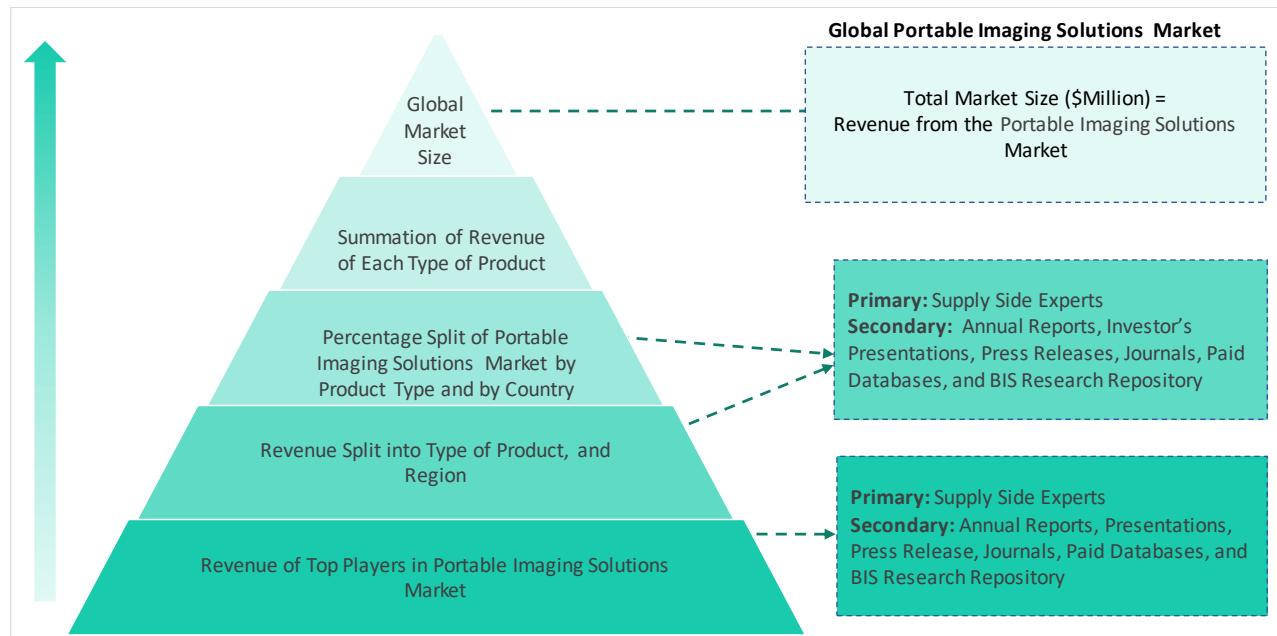
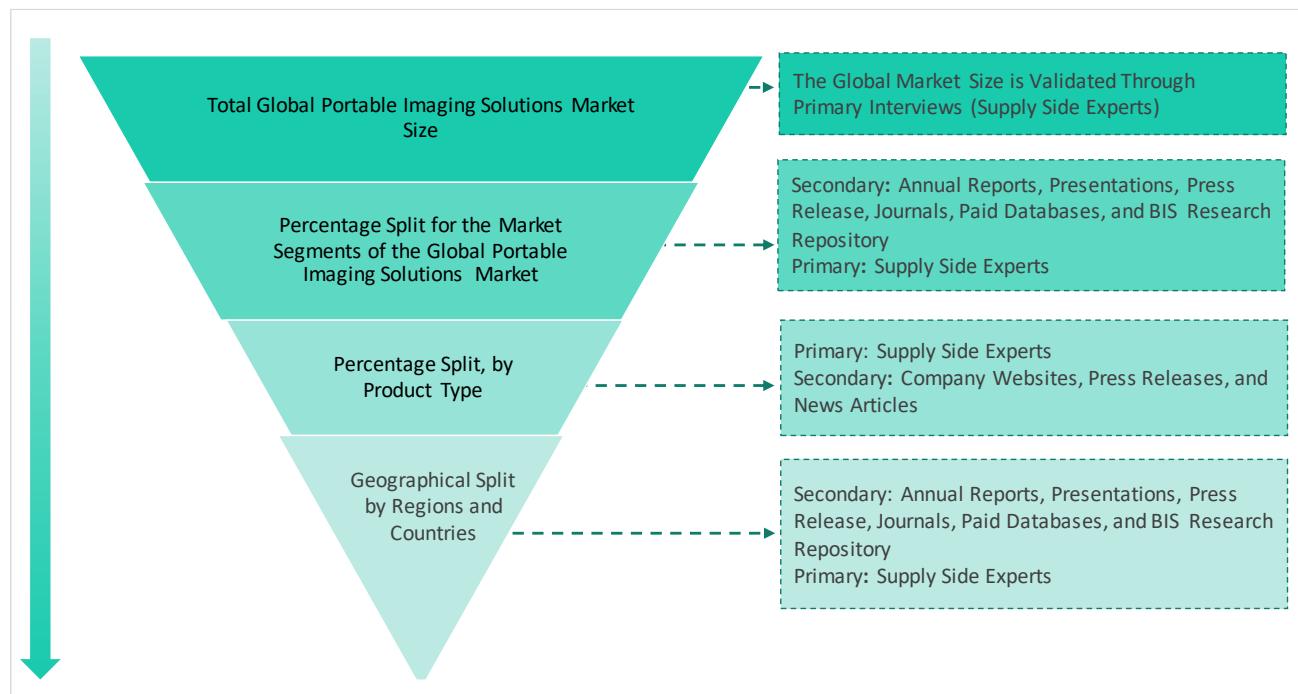


Figure: 9.7 Top-Down Approach


Having estimated the global market size, the analysis employs a set of macro factors such as the population, disposable income, healthcare expenditure, and GDP, among others to forecast the market size.

9.3 Data and Prediction Modelling

Where no hard data was available, modelling was used to produce comprehensive data sets. A rigorous methodology was adopted in which the available hard data was cross referenced with the following data types to produce estimates:

Figure: 9.8 Considered Factors for Data Prediction and Modelling




BIS Research

Global Portable Imaging Solutions Market

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