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ULTRASOUND MARKETS

(SAMPLE COPY, NOT FOR RESALE)

Trends, Industry Participants, Product Overviews and Market Drivers

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1. Overview

1.1 Statement of Report

Ultrasound represents a low-cost and efficacious imaging technology that continues to help radiologists and others collect significant clinical data about patients. Ultrasound is appropriately suited to many patients. No other imaging modality gives patients a real-time viewing at their anatomy or inspires discussions with physicians about their symptoms and the evidence of disease on the monitor. Ultrasound is radiation-free, patient-friendly and less-expensive. The adoption of this modality by all categories of hospitals and other healthcare institutions has given rise to new market opportunities for manufacturers of ultrasound systems and components suppliers. Ultrasound imaging systems have become conventional in almost all the offices of cardiologists, obstetricians, surgeons and urologists among other specialists. New uses, such as the applications of ultrasound in dispensing emergency medicine, along with new hand-held portable systems are helping to further propel the medical marketplace for the technology. Additionally, ultrasound imaging systems attract users simply because of their emphasis on user-friendliness, compactness and mobility.

Experts consider the ultrasound market's flexibility, ease of use, relative lower cost, trend to miniaturization and wide adoption of portable ultrasound equipment as drivers for sustained growth. The market adoption has been very quick in North America and Europe, and acceptance of portable equipment is gaining ground in almost all the developed and developing regions of the world. Growth is particularly greater for mid-range and low-end segments. The global ultrasound imaging system market comprises the developed markets of the U.S. and Europe, as well as the developing markets of Brazil, Russia, India and China (i.e., BRIC countries). Undisputedly, the U.S. is the largest global market for ultrasound systems. On the whole, the world market for ultrasound systems is witnessing a steady growth in spite of the impact of the economic downturn. It has been noticed that growth is slow in the developed economies due to the maturity of the markets. Thus in the developed economies, growth will mainly be driven by the purchase of higher-priced systems. Developing markets have been less affected by the economic crisis and market growth progresses with out much restraints. In the U.S., the overall diagnostic imaging market has been negatively impacted by growing skepticism surrounding health care reforms and the prospect of reduced reimbursement.

1.2 Scope of the Report

The main objectives of this analysis are to:

- Identify viable technology drivers through a comprehensive look at various platform technologies for ultrasound markets.
- Obtain a complete understanding of the chief ultrasound markets' tests—predictive, screening, prognostic, diagnostic and monitoring—from their basic principles to their applications.
- Discover feasible market opportunities by identifying high-growth applications in different areas, with a focus on the biggest and expanding markets.
- Focus on global industry development through an in-depth analysis of the major world markets for ultrasonography, including forecasts for growth.
- Establish the essentials of the ultrasound market including definitions, processes and trends.

Market figures regarding the current value of the ultrasound market are taken from the most recently available data of the global medical products industry. This examination covers the following categories of ultrasonography:

- Prenatal ultrasound.
- Cardiology-imaging ultrasound.
- Handheld ultrasound.
- Three-dimensional (3D) ultrasound.
- Four-dimensional (4D) ultrasound.

Analysis includes the use of charts and graphs measuring product growth and trends within the marketplace. In addition, a discussion of research into ultrasonography provides the reader with a deeper understanding of the possibilities for future treatment and avenues for possible R&D budgets. Company-specific information, including sales figures, product pipeline status and R&D trends, is provided throughout the report. The report will:

- Assess the ultrasound market drivers and bottlenecks from the perspective of the scientific community.
- Discuss the potential benefits of the ultrasound market for various sectors of the medical community.
- Establish the current total market size and future growth of the ultrasound market and analyze the current size and growth of various segments.
- Provide current and forecasted market shares by company.
- Discuss profit/business opportunities by imaging segment.
- Provide strategic recommendations for near-term business opportunities.
- Assess current commercial uses of the ultrasonography market.
- Review the ultrasonography business models.

Ultrasound and other medical imaging products include hardware, software and supplies used to create, view and manage visual images of non-visible organs of the human body for purposes of research, diagnosis and guidance of noninvasive surgery. This study focuses on end-user markets including hospitals, research facilities, freestanding clinics, doctor's offices and equipment-leasing companies. Ultrasound products usually are sold bundled as systems for creating or managing images. Systems include some or all of the following:

- Radiation source.
- Radiation detector.
- Patient table and gantry.
- Computers and displays.
- Robotic software.
- Image-acquisition software.
- Image-management software.
- Virtual-reality software.
- Computer-aided detection (CAD) software.

This analysis focuses on companies that are actively developing and marketing ultrasound technologies. The reader should consult other TriMark Publications reports at <http://www.trimarkpublications.com> for a detailed discussion of the important individual market segments that are related to the ultrasound markets, such as *Picture Archiving and Communications Systems (PACS)*. Other TriMark reports cover the specific sectors within the medical imaging market include: *European Medical Imaging Markets*, *Mammography World Markets*, *Nuclear Cardiology Markets* and *Positron Emission Tomography (PET) Markets*.

The emphasis in this examination is on the ultrasound market segment in important worldwide markets such as the U.S., Japan and Europe. It focuses primarily on the hospital market segment and, separately, describes the instruments, reagents and supplies marketed by major companies in this segment. The analysis discusses the market size, growth rates and market components for instruments and reagents, controls and consumables used in ultrasound, with emphasis on contrast media and biopharmaceuticals used to enhance imaging resolution. This study reviews the market for ultrasound in the clinical hospital market. It defines the dollar volume of sales, both worldwide and in the U.S., of the market and analyzes the factors that influence the size and the growth of the market segments. The report discusses activity and trends in the hospital markets and examines in detail the trends that have stimulated this market. This analysis also comments in detail on the patterns of information processing in the ultrasound markets. All of the companies known to be marketing, manufacturing or developing ultrasound in the U.S. and worldwide are surveyed. Leading companies are discussed in depth with a section on the history of the company, its product line, business and marketing analysis and a subjective commentary on the position of the company in its market.

1.3 Methodology

The author of this report has an M.D. with a specialty in clinical radiology. The editor is a retired college professor with three decades of experience in teaching biochemistry, biotechnology and pharmacology. Company-specific information is obtained mainly from industry trade publications, academic journals, news and research articles, press releases and corporate websites, as well as annual reports for publicly-held firms. Additionally, sources of information include the non-governmental organizations (NGOs) such as the World Health Organization (WHO) and governmental entities like the U.S. Department of Health and Human Services (HHS) and U.S. federal agencies such as the National Institutes of Health (NIH), the Food and Drug Administration (FDA) and the Centers for Disease Control and Prevention (CDC). The other sources include *MedImaging*, Royal College of Radiologists, Texas Instruments, *Medical New Today*, *DiagnosticImaging*, *Medical Buyer*, Better Anesthesia through Sonography (BATS) and American Society of Radiology.

Some of the statistical information was taken from Biotechnology Associates' databases and from TriMark's private data stores. The information in this study was obtained from sources that TriMark believes to be reliable, but do not guarantee the accuracy, adequacy or completeness of any information or omission or for the results obtained by the use of such information. Key information from the business literature was used as a basis to conduct dialogue with and obtain expert opinion from market professionals regarding commercial potential and market sizes. Senior managers from major company players were interviewed for part of the information in this report.

Primary Sources

TriMark collects information from hundreds of Database Tables and many comprehensive multi-client research projects, as well as Sector Snapshots that are published annually. TriMark extracts relevant data and analytics from TriMark's research as part of this data collection.

Secondary Sources

TriMark uses research publications, journals, magazines, newspapers, newsletters, industry reports, investment research reports, trade and industry association reports, government-affiliated trade releases and other published information as part of its secondary research materials. The information is then analyzed and translated by the Industry Research Group into a TriMark study. The Editorial Group reviews the complete package with product and market forecasts, critical industry trends, threats and opportunities, competitive strategies and market share determinations.

TriMark Publications Report Research and Data Acquisition Structure

The general sequence of research and analysis activity prior to the publication of every report includes the following items:

- Completing an extensive secondary research effort on an important market sector, including gathering all relevant information from corporate reporting, publicly available databases, proprietary databases, direct meetings, and personal interviews with key personnel.
- Formulating a study outline with the assigned writer, including important items:
 - Market and product segment grouping and evaluating their relative significance.
 - Key competitors' evaluations including their relative positions in the business and other relevant facts to prioritize diligence levels and assist in designing a primary research strategy.
 - End-user research to evaluate analytical significance in market estimation.
 - Supply chain research and analysis to identify any factors affecting the market.
 - New technology platforms and cutting edge applications.

- Identifying the key technology and market trends that drive or affect these markets. Assessing the regional significance for each product and market segment for proper emphasis of further regional/national primary and secondary research.
- Launching a combination of primary research activities including two levels of questionnaires, executive-direct focused, company-specific, and region-specific communications to qualified and experienced senior executives worldwide.
- Completing a confirmatory primary research assessment of the report's findings with the assistance of Expert Panel Partners from the industry being analyzed.

1.4 Executive Summary

Ultrasound is an appropriate tool that permits emergency physicians to take initial management decisions based on information rather than educated guesswork. Ultrasound system market comprises modalities that find applications in cardiology, radiology, vascular, women's health and emerging applications (regional anesthesia, emergency medicine, surgery, critical care and vascular access). Growing number of physicians rely on ultrasound in a variety of clinical settings across Asia Pacific, Middle East, Europe and North America. Future growth of ultrasound imaging systems market will primarily be fueled by portable and hand-held devices to be used in clinical applications that need point-of-care imaging. Yet, the ultrasound market will have to face severe competition from other modalities such as CT and MRI. The global market for stand-alone and portable ultrasound machines in [REDACTED] was worth about \$ [REDACTED] and it is forecast to grow and reach \$ [REDACTED] in [REDACTED].

Medical ultrasound was introduced in 1950s and since then, it has garnered a major share in medical imaging market, occupying the second place, next only to X-rays. In modern healthcare settings, the ultrasound imaging systems are omnipresent, found everywhere in the medical establishments of surgeons, obstetricians, cardiologists, pediatricians and others. The technology is quite safe with no harmful radiations and put into use in a wide variety of patients. Of late, it has also found a place in the administration of emergency medicine. The recent introduction of portable and hand-held instruments has further propelled the demand for ultrasound imaging products in the medical field. Globally, these simple modalities have helped the vendors in generating significant market opportunities, as the new technologies have proven themselves to be effective and low-cost. In [REDACTED], the global market for the compact ultrasound imaging systems was worth about \$ [REDACTED] and this is likely to reach \$ [REDACTED] in [REDACTED].

The U.S. and Canadian markets for ultrasound systems are fast becoming replacement markets. Hospitals in this geographical region offer opportunities for replacing high-end units with newer ones in OB/GYN segment and acquiring large numbers of portable and low-cost systems in emergency and anesthesia segments. All these segments are showing signs of maturation and a healthy replacement rate can be assured in future. The North American region offers continued growth potential for point of care ultrasound, cardiology ultrasound, interventional ultrasound and specialty ultrasound systems. The ongoing trends reveal that the revenues generated from these segments will outperform the growth in the overall market. Hand-carried ultrasound (HCU) imaging equipment is steadily capturing a share in the ultrasound equipment market, as it is capable of providing adequate support for standard imaging procedures at the point of care. Vendors have found this segment to be more lucrative as HCU systems are garnering a larger share of revenues in the global market. The U.S. market for portable ultrasound systems was worth about \$ [REDACTED] in [REDACTED] and it is predicted to reach \$ [REDACTED] in [REDACTED].

In Europe, ultrasound has been witnessing significant progress over the last five to six decades; from simple, A-line scans to multidimensional scans (portable handheld devices) with network connectivity. This growth has been made possible by the sophisticated software developed and innovative analytic methods evolved to interpret the data. Ultrasound holds the potential to become the gold standard for guidance in minimally-invasive surgeries, biopsies and ablation procedures. The color Doppler ultrasound systems will have a significant contribution to the overall market value in future.

The growth in color Doppler ultrasound systems is principally propelled by factors such as high level of reliability and stability in diagnostic scan applications, advanced digital technology features, capability of producing high-resolution images and high adoption rates. Hand-carried ultrasound (HCU) systems will play a major role in fueling the overall market growth. Innovations in technology, evolution in software development and miniaturization of the system are leading the way for high performance HCU systems. HCU are relatively cheaper, more flexible in nature and soon can replace the expensive cart-based systems in the near future. The HCU systems are being used to assess cardiovascular abnormalities and used at the bedside. Siemens Healthcare, Philips Medical and GE Healthcare are the market leaders with Siemens playing a leading role in this European region. TriMark estimates that the European market for ultrasound systems was worth about \$ [REDACTED] in [REDACTED] and it is forecast to reach \$ [REDACTED] in [REDACTED].

The Chinese market has been witnessing significant growth over the last two years in ultrasound imaging. Strongly influenced by China's ongoing healthcare reform and impressive economic growth, the Chinese market for ultrasound equipment has been immensely benefited from the government's focus on upgrading medical devices in the thousands of township and county hospitals across China. The growing demand has enabled the entry of multinational companies to refocus on the low-end of the market by setting up local joint ventures, expanding their product lines and rebuilding sales channels. Though initially supported by the government, the hospitals in China have now started updating their ultrasound systems on their own and this has been fueling the growth. TriMark estimates that the Chinese market for ultrasound imaging equipment will be more than \$ [REDACTED] by [REDACTED], growing at a CAGR of [REDACTED] %.

India has been consistently keeping pace with the developed world in acquiring and applying new technology in healthcare. The first X-ray machine was introduced into the country in 1902, the first CT scanner was installed in 1978, ultrasound in 1975, MR in 1983 and PET in 1996. With its huge population India has an expeditiously increasing middle class of about 400 million people who can afford paying for modern health care including for medical imaging. The remaining 550 million Indians are poor but are largely provided with healthcare needs by government funded tertiary care hospitals. Today, the Indian market for ultrasound imaging market is worth about \$ [REDACTED] and there are 2,775 color systems and 1,250 black & white ultrasound systems in the country. This market is predicted to grow steadily and reach \$ [REDACTED] in [REDACTED].