The FocalPoint Group

Report

Wireless in Healthcare:

A Study Tracking the Use of RFID, Wireless Sensor Solutions, and Telemetry Technologies by Medical Device Manufacturers and Healthcare Providers

ABOUT FOCALPOINT

FocalPoint is the premier research and consulting firm committed to providing market intelligence and support to the suppliers and beneficiaries in the M2M arena. Through our objective assessment of the M2M space, we identify underlying problems and the potential solutions that will ultimately accelerate the rate of adoption. Additionally, we work with experts, technology enablers, incorporators, end users, and the media to create an informed and active community of interest.

Table Of Contents

Table Of Exhibits

Executive Summary

I. Executive Summary & Key Findings

Adoption of wireless in healthcare is imminent

The American Healthcare system is on the verge of a crisis, with financial stresses forcing both caregivers and patients to demand change. While advanced medications and other sophisticated treatments are more effective than ever, they also come with sky-high price tags. Compounding the situation, these same remedies are also transforming once fatal diseases into long-term conditions, which are managed by high-priced therapies. Given the growing population and longer lives of the elderly, new approaches to patient care must be created.

Fortunately, technology is converging at this threshold to offer feasible solutions. RFID tags are enabling better asset tracking. WiFi and packet radio are allowing for mobility of patients and caregivers. Sensor networks can be used to detect bio-terrorism and support emergency responders. By adopting and integrating new technologies, decision-makers in the Healthcare industry can greatly improve efficiency and profitability - all while enhancing and perfecting patient care.

The US spends $1.5 Trillion a year on Healthcare

However, much still needs to be done. The $1.5 Trillion Healthcare industry currently spends only 5 percent on information technology, and even less on wireless technologies. Concerns for reliability, signal interference, battery life, cost, security, and FDA approvals have kept industry leaders from deploying wireless more visibly. The next decade will place increasing burdens on healthcare providers and patients, and so it will be critical for the industry to aggressively integrate emerging networking technologies that improve productivity and quality of care.

To aid executives in improving the state of healthcare in this country, we created this study which investigates the levels and type of activity occurring with wireless data technology in the industry today. We identify emerging solutions, existing implementations, drivers and challenges, attitudes and activity, and growth rates. This report attempts to provide insight into the way in which wireless solutions are likely to be utilized and adopted over the next 2-6 years.

A number of key conclusions emerged that will impact the ways in which executives should be responding:

- **Medical device manufacturers and hospitals have been slow to recognize the benefits of wireless data technologies – wireless will not be successful without greater education.**
- **WiFi and Bluetooth will introduce the industry to wireless applications, but other technologies will gain in importance down the road.**
- **The “Baby Boomers” demographic will demand significant and unseen adoption of wireless technologies, particularly telemedicine and remote patient monitoring, with a shift in focus from reactive to proactive care.**

- **Wireless data applications will not be utilized everywhere. Instead, wireless applications will be used in a complementary manner to legacy and wire-based systems.**

- **Existing implementations have emerged across diverse environments and are already demonstrating investment payback and improved service quality.**

- **The overall U.S. wireless data networking and related servicing opportunity in the Healthcare sector will grow to over $7 billion by 2010, with the potential to be much higher given proper development.**

The Impact of Wireless will be Significant

As the players in the healthcare industry adopt wireless data technologies in greater degrees, the impacts will be significant…

1. Medical device manufacturers can begin to reconfigure their products and their business models to reflect mobility, continuous monitoring and lifecycle management, quality assurances and service level agreements, pay-per-use charging, and theft/tamper prevention.

2. Healthcare providers will be able to better allocate resources, prioritize and build consistency in treatments, and offer more complete and direct care to patients.

3. Patients will be able to gain better and real-time information and care, and begin to self-treat and improve their overall health condition outside of the confines of a hospital or doctor's office.

4. Technology vendors have an opportunity to creatively and effectively enable new medical applications that will improve worker productivity levels, health conditions, and overall costs for medical treatments.

With the degree of benefits that can be derived from the application of wireless technologies in the Healthcare industry, we believe this research should provide timely and critical information to the innovators and leaders that will propel the industry forward.

1. Report Overview

I. Purpose & Objectives

Increasing Demands are Colliding with Dwindling Resources

With increasing demands colliding with dwindling resources, the healthcare industry is now confronting the biggest dilemma ever. Industry problem solvers will undoubtedly look toward the newest technologies, including wireless, to address the issues. We created this report to provide an in-depth look at how wireless technologies are currently being used in healthcare and medical devices and the potential for the future.

Also recognizing the need for taking advantage of new technologies to improve healthcare was the National Committee on Vital and Health Statistics. On November 15, 2001, they issued the following challenge:

We as a Nation have a timely opportunity and an urgent need to build a 21st-century health support system – a comprehensive, knowledge-based system capable of providing information to all who need it to make sound decisions about health. Such a system can help realize the public interest related to disease prevention, health promotion, and population health.

While the adoption and integration of wireless technologies poses a significant challenge, the effort is worthwhile with hospitals and Medicare practically running on empty. Taxing the system is the onslaught of retiring baby boomers, who will greatly increase the demand for high-quality healthcare. But, with budget-trimming cutbacks in hospital staff, overworked clinicians are making far too many mistakes in caring for and treating patients. Unfortunately, health insurance companies continue to decrease reimbursement amounts, leaving providers to deal with the loss in revenue and/or to pass the costs on to patients.

It is wireless technologies, in part, that will provide solutions to cutting costs, improving efficiency and maximizing the use of limited funds, while also enhancing patient care. At the same time, these solutions will improve communication, which could facilitate the integration of lifesaving new research and allow for the detection, preparation and reaction to bioterrorism.

Wireless will Enable Major Structural Change

Already, new wireless data technologies and applications are making significant impacts at forward-thinking institutions and companies. With more signing on, wireless technologies will enable major structural changes in the U.S. healthcare industry. Remote telemedicine, product/supplies tracking, and equipment monitoring are driving efficiencies that could not have come at a better time. These technologies are emerging to provide ordinary Americans the means to receive the expert advice and guidance necessary to achieve affordable, high-quality care for this next century—and to provide clinicians the wherewithal to provide it.

In this report, we examine the latest advances, attitudes, and impacts that new wireless technologies will have in the healthcare arena. From this work, we hope that technology vendors, medical device manufacturers, investors, medical professionals, and hospital administrators will gain a better sense of the acceptance of wireless technology and how it will undoubtedly be used to change the healthcare industry.

II. Methodology

Our Research Analyzes the Acceptance of Wireless Technologies

Our research analyzes the acceptance of wireless data technologies including cellular, RFID, WiFi and others in the Healthcare arena. We focused specific attention on discovering how equipment manufacturers are incorporating wireless technologies into their products. We also wanted to examine how wireless networking ranks among existing priorities and the likelihood of adoption and deployment, particularly during the next two to three years. Research and analysis took place primarily in the months from March to June of 2004.

We gathered key information such as the overall market size and growth, trends and forces, products, and major vendors by culling information from market analyst reports, 10-Ks, journals, articles, and various trade associations.

We then generated a list of medical companies and identified companies relevant to our research. Companies of interest included not only the major players, but also smaller manufacturing companies and those developing and engineering new devices. Once we established a list of relevant companies, we identified key people who were most appropriate to survey.

During the primary research phase of the project, we utilized a telephone questionnaire as well as an on-line survey (see Appendix for samples). The contact list consisted of executives with titles including Director of Research & Development, Vice Presidents of Engineering, as well as Product Managers.

III. Report Outline

1) "Chapter One: Report Overview" provides the objectives, methodology, outline, and intended audience background.

2) "Chapter Two: The State of Healthcare in the United States" deals with the current state of healthcare, detailing overall expenditures, changing demographics and disease types, labor shifts and shortages, and quality of care issues.

3) "Chapter Three: Emergence of Wireless Technologies" delves into the wireless technologies that will be utilized to face the issues of a growing Healthcare system.

4) "Chapter Four: Wireless Applications and Implementations" outlines areas of wireless adoption and activity and provides insight into the impacts and benefits of wireless technologies.

5) "Chapter Five: Challenges for Wireless in Healthcare" discusses the challenges and obstacles of implementing wireless technologies.

6) "Chapter Six: Medical Device Manufacturers & Adoption Factors" is a review of the medical device manufacturers, their financial condition, and their likelihood to implement wireless technologies in the near future.

7) "Chapter Seven: Projecting Wireless Adoption in Healthcare" provides a perspective of how wireless will be adopted over the longer term, including projections of various types of revenue streams that will result from using wireless technologies.

8) "Chapter Eight: Recommendations & Conclusions" details steps that device manufacturers, care providers, and wireless vendors can take to compete in a wireless networked environment.

9) "Appendices" include company profiles, questionnaires, and additional information.

IV. Target Audiences for the Report

The audiences for this report include the following:

Healthcare Administrators & Professionals
This report will provide the reader with key information about the latest activities in wireless adoption within the Healthcare industry. From this report, the reader will gain an understanding of emerging trends, successful implementations, expected activity from others, challenges of adopting and integrating wireless solutions, and insight into how to improve quality of care and reduce costs.

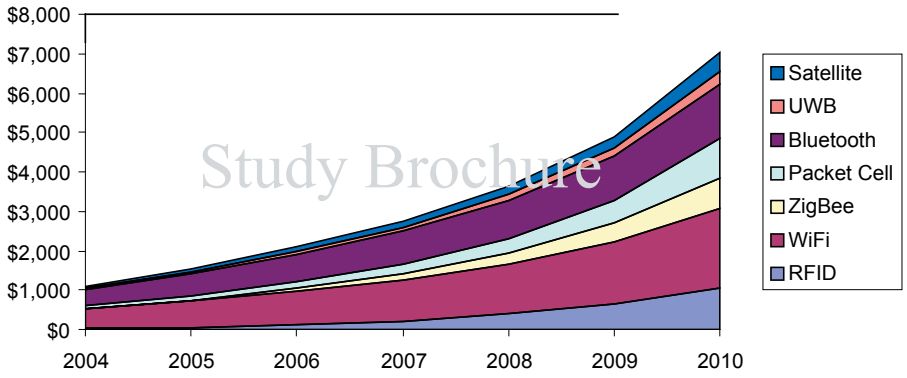
Medical Device Manufacturers
For companies providing products and services to the Healthcare industry, we will show that there is a major opportunity to take advantage of wireless technologies for manufacturing, shipping, installing, tracking/operating, maintaining, and servicing products. This report will provide insight into how and when to invest, the applications to develop, and the overall opportunity for your business.

Technology Vendors and Systems Integrators
Companies providing the nuts and bolts infrastructure to enable an improved healthcare system have a direct interest in knowing how rapidly this market is going to adopt wireless technologies. This report provides an in-depth look at the ways in which wireless technologies are improving the quality of care in the industry and in reducing costs, which help to create the ROI propositions necessary to grow your business.

Analysts and Investors
Gaining a sense of the challenges and opportunities surrounding the Healthcare industry has never been more important. With changes in legislation, culture, operating practices, and technologies, the ability to understand the potential for growth and profitability in this industry has never been so challenging. This report will provide direct insight and commentary from industry leaders poised to change the way healthcare is provided in this country. Not only will you gain a sense of the activities in the arena, but also see the potential growth and adoption of wireless (and the resulting changes in efficiencies and business models).

EXHIBIT 24

Wireless Technology Market Sizes ($ millions)



	2004	2005	2006	2007	2008	2009	2010
RFID							
WiFi							
ZigBee							
Packet Cell							
Bluetooth							
UWB							
Satellite							
Total							

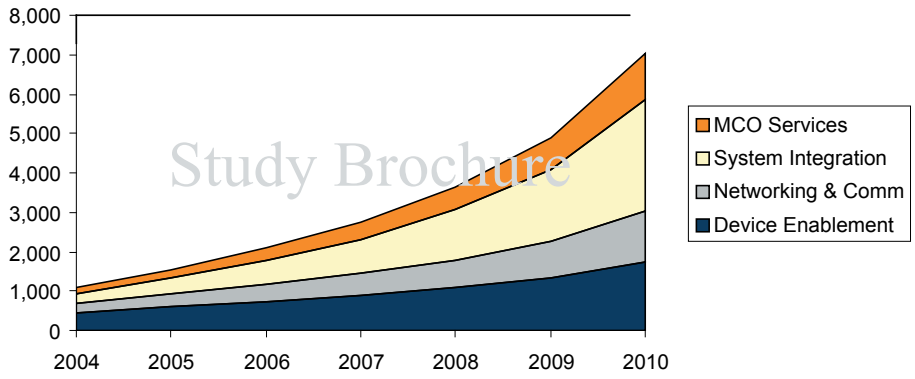
Source: FocalPoint Analysis

In addition, we identified how the various revenue opportunities for vendors would break out. We created a graph that shows the total dollar value of wireless in the healthcare sector, and compared specific revenue streams as a percentage of the total value. The streams include four main categories: Device Enablement, Networking & Communication, System Integration, and MCO Services.

- Device Enablement includes the value of microchips, communications ports, device-level networking software, boards, additional electronic components and interfaces, and device re-design and development costs.
- Networking and communications includes the value of networking cards, radios, terminals, gateways, LANs, routers, switches, firewalls, and airtime or service contracts for wired and wireless data communications.
- System integration includes the value of the labor costs associated with designing, deploying, installing, and activating an M2M solution within an environment.
- MCO (Monitoring, Control, & Optimization) services include the value of operating a monitoring facility (NOC), server farms, and alert team. Also includes the exception reporting software and activation support systems.

Each of these revenue streams will grow over time, but some will become commoditized. For instance, device enablement will become cheaper with each additional installation (and because of economies of scale). Networking and communications revenues will also become cheaper over time, due to the low marginal costs of adding additional wireless services once a network has been installed. Systems integration costs will continue to increase as environments become more complex and require greater integration with existing or supplementary networks and databases. MCO services will remain fairly constant over time, as improved tools and productivity functions cancel out increasing costs in labor. Each of these drivers has been considered in our calculations.

EXHIBIT 25 Wireless Technology Market Sizes by Service Type ($ million)



	2004	2005	2006	2007	2008	2009	2010
Device Enablement							
Networking & Comm							
System Integration							
MCO Services							
Total							

Source: FocalPoint Analysis

IV. Technology Specific Forecasts

The explosion of wireless protocols has created an environment of cost pressures, competition, and innovation that will ultimately help the healthcare environment. Many of today's protocols are aggressively competing against one another on price, security, reliability, and ease of installation, configuration, and use. Despite the progress being made, the biggest competitors for wireless are wired solutions or simply nothing at all. Beyond that, wireless protocols most often compete against one another on bandwidth, distance, latency, and power consumption. As the vendor ecosystems creating wireless solutions mature, the clarity and focus of individual wireless protocols will become more articulated, helping adopters to understand how each type of wireless technology matches with their needs rather than falling short or being overkill.

EXHIBIT 26 Year / Year Growth Rate of Technology Markets

	2004	2005	2006	2007	2008	2009	2010
RFID							
WiFi							
ZigBee							
Packet Cell							
Bluetooth							
UWB							
Satellite							
Total	46.7%	46.9%	35.5%	31.0%	32.4%	34.6%	43.4%

Source: FocalPoint Analysis

The FocalPoint Group, LLC

Wireless Data in the Healthcare Arena

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We want to thank you for your interest in The FocalPoint Group. By completing and returning this order form, you will have secured your interest in obtaining the research report. Upon receipt, this document will serve as your intent to receive and pay for the study, net due in 15 days from receipt of this fax.

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I hereby signify interest in ordering the FocalPoint Wireless In Healthcare study. I understand that the study will cost $2,500 for an enterprise license (Corporations over 20 employees and for intranet publication) or $1950 for a single-user license. Please select which license you are ordering…

- ☐ Enterprise License (Corporations over 20 employees)
- ☐ Single-user License

Upon completion please fax to: (415) 520-9696

Thank you and we hope you enjoy.

Best regards,

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