FROST & SULLIVAN

Customer Value Leadership Award

RFID Solutions in Healthcare

Contents

Background and Company Performance
Industry Challenges

Concurrent with the digital technology convergence in recent years, radio-frequency identification (RFID) scanners and tags enable new efficiencies and advantages for end-to-end asset tracking and management. RFID solutions empower the growing ubiquity and prominence of Internet of Things (IOT) based systems creating new mountains of data and opening new realms of opportunity. RAIN RFID is a form of wireless communication that uses the global UHF RFID protocol standard developed by GS1 and ISO formed by a trade group, nodding to the link between RFID technology and cloud systems to tag, manage, and share data via the Internet. With greater quantities, and more detailed, asset data decision makers are better informed, and applications across industry verticals can achieve the benefits of enhanced supply chains.

In particular, the healthcare sector presents myriad opportunities for RFID-enabled solutions to enact better patient care and cost savings through asset and personnel tracking. At the same time, healthcare delivery organizations (HDOs) and pharmaceutical providers feel the pinch from regulations mandating supply chain security, such as the Food and Drug Administration's Unique Device Identification guidelines and the Drug Supply Chain Security Act, they also must work to do more with less personnel and monetary resources.[1]

RFID systems are an essential piece of the puzzle for creating new efficiencies and savings, capturing data and providing asset connectivity, as part of the emerging Smart Healthcare trends. Smart Healthcare, an approach advocating for systems based on personalized and connected solutions to entrenched problems, has witnessed an explosion of IoT applications in the last five years. The most promising of these solutions offer the potential to help healthcare service providers and network stakeholders improve process efficiency and deliver more cost-effective services. For example, current manual supply stocking of bin based cart systems requires staff to make rounds throughout the facility restocking carts with little if any visibility of what or how many items may be required in any given place. Automating this workflow would drastically increase efficiency and better ensure critical supplies remain on hand. Moreover, the low cost of some RFID tags creates opportunities for solutions designed to process and report on high volume items such as records, supplies, drugs, and specimens. Throughout the supply chain of a HDO, numerous opportunities exist for increasing efficiency, decreasing equipment loss, and enabling higher levels of patient safety with more accurate identification and tracking of items and devices.[2]

Despite the promise of Smart Healthcare, challenges restrain some solution adoptions. Data security concerns and adequate precautions give pause to many decision-makers. End users evince reluctance to altering convention techniques and technologies to new, more advanced platforms. A lack of standardization, deriving from the plethora of

---

[1] RFID Technology is a Quintessential Part of the Internet of Things, *Frost & Sullivan*, 2016.
[2] Technologies Empowering Smart Healthcare: The optimal Synergy Between Leading-edge Hi-Tech and Digital Innovation, *Frost & Sullivan,* 2016.

available systems and protocols, makes interoperability difficult in some cases. Moreover, large scale deployment of smart systems can raise significant concerns over capital expenditures and operating expenditures. Demonstrating low implementation costs and fast setup appear to be the final keys to overcoming reluctance to new systems, according to Frost & Sullivan Research.[3]

Customer Impact and Business Impact of Impinj, Inc.

Since its founding in 2000, Impinj, Inc. (Impinj) offers a versatile line of solutions geared to applications across industry verticals from retail to food and beverage, as well as pharmaceutical and healthcare. Impinj provides the sensing and locating technology solutions that enable healthcare providers to direct more of their attention to patients and reduce the friction of keeping track of items and supplies.

A Holistic System

In healthcare deployments, the Impinj RAIN RFID platform differentiates itself from other asset and supply management scenarios with its lower costs, expanded capabilities, and a holistic approach. Traditional by-hand asset and supply tracking systems are extremely inefficient and labor dependent. Legacy active scanning technologies are highly limited in their applications, running at approximately $40 to $50 per tag. In contrast, the Impinj system has broken the "sub 10 cent" per tag barrier, offering an economic value that scales up for the largest HDOs and demonstrates a level of cost-effective monitoring that enables application even for inventorying consumables. The nature of RAIN RFID technology requires no batteries or external power source, reducing maintenance and staffing costs over longer periods of shelf life. The company focuses on innovation, and from its background in chip and reader design, it now applies advances in passive RFID technology. With the new generation of automated, passive RFID tracking, where each RFID tagged item is powered and identified with an always on reader or gateway, coverage requires no human operators in the room. Impinj truly rounds out its exemplary value offering with the item management platform, where each piece of the solution – from endpoints to connectivity to software – functions together as designed and costs of implementation and integration are lower for customers and partners deploying RAIN RFID solutions.

Integration at Each Level

Unique within the market, Impinj's integrated platform approach to RFID technology provides HDOs with a solution designed at three layers to work together holistically and not simply piecemeal

RAIN RFID Basics

Source: Impinj.

---

[3] Innovations in Smart Healthcare – Future Tech TechVision Opportunity Engine, *Frost & Sullivan*, 2016.

components cobbled together, as in the past. With the streamlined system designed as a whole, the tagged chips with the data and information about the object stored inside function seamlessly with the reader systems, which feed into the Software layer and aggregates the data from readers across the organization to introduce a single point of interface and tracking for all systems. The software layer acts as an operating system for a RAIN RFID implementation. HDOs and third-party solution providers, such as asset tracking software providers, easily integrate with the data flow from the software layer generated by the thousands of devices and tagged objects.

Enabling Efficiency and Cost Savings

As HDOs increasingly automate their supply chains more and more opportunities for RAIN RFID applications open up for realizing efficiencies and lowering costs. Up and down the supply chain, from manufacture to distribution, items and assets will be tracked and managed individually and the data aggregated as a whole through automation. As HealthCare providers and pharmaceutical distributors fall under greater degrees of scrutiny by regulators, barcode based automation cannot scale up to reach the economies of scale required, especially for larger organizations. Impinj plays an enabling role in many scenarios previously handled by manual counting or active tracking technology; RAIN RFID solutions can manage supply chains containing hundreds of thousands of items and assets, at a fraction of the cost without interruption. Impinj's RAIN RFID solutions reach further back down the supply chain as hospitals, distributors, and partners all require a unified protocol for item management. From its impressive market share position in the RFID market, Impinj offers a compelling proposition and continued performance to remain on the leading edge of emerging regulatory requirements and technological advances.

Exceptional Positioning for the Future of Healthcare

As the potential applications increase, Impinj occupies a prime position in an ever-expanding ecosystem of partnering companies, HDOs, and equipment providers. Impinj is smartly in the early stages of a strategic push into the healthcare sector, growing its presence and awareness in the market. Growing out of its role as simply a components company, Impinj cultivates partnerships with enterprise grade manufactures and HDO solutions providers to bring fully developed solutions to customers and expand its reach throughout the value chain as a solutions and platform provider. This strategy enables Impinj to partner with third-party software applications and approaches the tipping point of RFID ubiquity. Software companies and device and asset producers are partnering with Impinj to enter the passive automation space they previously felt reluctant to compete in without the expertise Impinj brings to the table. Along with strategic partnerships with major solutions providers such as STANLEY Healthcare, Conexus, DeRoyal, ARC Healthcare Technologies, VUEMED, Accruent, and Terso, Impinj is developing dedicated healthcare content and webinars in addition to industry specific talent. Building from its technological advances and forward-looking investments in a platform, Impinj is poised with significant growth potential in asset and supply chain management in HDOs.

A Foundation of Reliability and Innovation

As Impinj drives into the healthcare sector, it draws from a proven foundation and respected reputation. The company achieved a significant portion of the market share in the RFID space through its history for producing products with reliability and quality, in the approximately 18 billion end points of chips deployed throughout the world. The extra value generated through an Impinj deployment derives from the whole platform approach the company brings to the market, where the RAIN RFID tag chips, gateways/readers, and software are all designed as parts of a greater whole to increase performance and ease use of RAIN RFID. Moreover, the company enjoys a history of innovation, surpassing 200 patents on the intellectual property of its solution system. Over its 16 years, Impinj consistently remains on the cutting edge of technological development and customer needs by maintaining an emphasis on innovation and a forward-looking approach to market demands.

Conclusion

As healthcare delivery organizations, and their supply chain providers, increasingly feel the pinch of margins, regulations, and efficiency demands, automated solutions can reorganize the entire process. With a history of high quality and reliable components, Impinj delivers a range of RAIN RFID-based solutions for passive asset and item tracking. With fully automated RFID-based solutions, customers save labor hours, restock with greater accuracy, and have less waste. Offering an entire solution, from tags, to readers, to management software, Impinj enables new levels of insight and efficiency through data drive supply chain management, so healthcare providers and staff can spend more time on patient care

With its holistic system for serving the needs of healthcare customers, Impinj, Inc. earns Frost & Sullivan's 2017 Customer Value Leadership Award for RFID healthcare solutions.

Significance of Customer Value Leadership

Ultimately, growth in any organization depends upon customers purchasing from a company and then making the decision to return time and again. Delighting customers is, therefore, the cornerstone of any successful growth strategy. To achieve these dual goals (growth and customer delight), an organization must be best-in-class in three key areas: understanding demand, nurturing the brand, and differentiating from the competition.

- Shift competitors' customers
- Increase renewal
- Increase upsell
- Customer value
- Increase market penetration

- Increase equity
- Improve recognition/ recall
- Inspire customers
- Value leadership
- Clarify value proposition

DEMAND

BRAND

Customer Value Leadership

COMPETITIVE POSITIONING

- Clarify superior positioning
- Superior value to customers
- Competitors fall behind
- Best implementation
- Value mapping

Understanding Customer Value Leadership

Customer Value Leadership is defined and measured by two macro-level categories: Customer Impact and Business Impact. These two sides work together to make customers feel valued and confident in their products' quality and long shelf life. This dual satisfaction translates into repeat purchases and a high lifetime of customer value.

Key Benchmarking Criteria

For the Customer Value Leadership Award, Frost & Sullivan analysts independently evaluated two key factors—Customer Impact and Business Impact—according to the criteria identified below.

Customer Impact

Criterion 1: Price/Performance Value
Criterion 2: Customer Purchase Experience
Criterion 3: Customer Ownership Experience
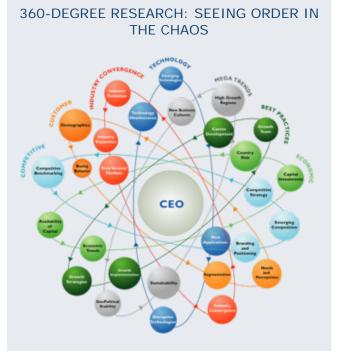Criterion 4: Customer Service Experience
Criterion 5: Brand Equity

Business Impact

Criterion 1: Financial Performance
Criterion 2: Customer Acquisition
Criterion 3: Operational Efficiency
Criterion 4: Growth Potential
Criterion 5: Human Capital

The Intersection between 360-Degree Research and Best Practices Awards

Research Methodology

Frost & Sullivan's 360-degree research methodology represents the analytical rigor of our research process. It offers a 360-degree-view of industry challenges, trends, and issues by integrating all 7 of Frost & Sullivan's research methodologies. Too often companies make important growth decisions based on a narrow understanding of their environment, leading to errors of both omission and commission. Successful growth strategies are founded on a thorough understanding of market, technical, economic, financial, customer, best practices, and demographic analyses. The integration of these research disciplines into the 360-degree research methodology provides an evaluation platform for benchmarking industry participants and for identifying those performing at best-in-class levels.

360-DEGREE RESEARCH: SEEING ORDER IN THE CHAOS

Best Practices Recognition: 10 Steps to Researching, Identifying, and Recognizing Best Practices

Frost & Sullivan analysts follow a 10-step process to evaluate Award candidates and assess their fit with select best practice criteria. The reputation and integrity of the Awards are based on close adherence to this process.

STEP	OBJECTIVE	KEY ACTIVITIES	OUTPUT
1 **Monitor, target, and screen**	Identify Award recipient candidates from around the globe	• Conduct in-depth industry research • Identify emerging sectors • Scan multiple geographies	Pipeline of candidates who potentially meet all best-practice criteria
2 **Perform 360-degree research**	Perform comprehensive, 360-degree research on all candidates in the pipeline	• Interview thought leaders and industry practitioners • Assess candidates' fit with best-practice criteria • Rank all candidates	Matrix positioning of all candidates' performance relative to one another
3 **Invite thought leadership in best practices**	Perform in-depth examination of all candidates	• Confirm best-practice criteria • Examine eligibility of all candidates • Identify any information gaps	Detailed profiles of all ranked candidates
4 **Initiate research director review**	Conduct an unbiased evaluation of all candidate profiles	• Brainstorm ranking options • Invite multiple perspectives on candidates' performance • Update candidate profiles	Final prioritization of all eligible candidates and companion best-practice positioning paper
5 **Assemble panel of industry experts**	Present findings to an expert panel of industry thought leaders	• Share findings • Strengthen cases for candidate eligibility • Prioritize candidates	Refined list of prioritized Award candidates
6 **Conduct global industry review**	Build consensus on Award candidates' eligibility	• Hold global team meeting to review all candidates • Pressure-test fit with criteria • Confirm inclusion of all eligible candidates	Final list of eligible Award candidates, representing success stories worldwide
7 **Perform quality check**	Develop official Award consideration materials	• Perform final performance benchmarking activities • Write nominations • Perform quality review	High-quality, accurate, and creative presentation of nominees' successes
8 **Reconnect with panel of industry experts**	Finalize the selection of the best-practice Award recipient	• Review analysis with panel • Build consensus • Select recipient	Decision on which company performs best against all best-practice criteria
9 **Communicate recognition**	Inform Award recipient of Award recognition	• Present Award to the CEO • Inspire the organization for continued success • Celebrate the recipient's performance	Announcement of Award and plan for how recipient can use the Award to enhance the brand
10 **Take strategic action**	Upon licensing, company is able to share Award news with stakeholders and customers	• Coordinate media outreach • Design a marketing plan • Assess Award's role in future strategic planning	Widespread awareness of recipient's Award status among investors, media personnel, and employees

About Frost & Sullivan

Frost & Sullivan, the Growth Partnership Company, enables clients to accelerate growth and achieve best-in-class positions in growth, innovation and leadership. The company's Growth Partnership Service provides the CEO and the CEO's Growth Team with disciplined research and best practice models to drive the generation, evaluation and implementation of powerful growth strategies. Frost & Sullivan leverages more than 50 years of experience in partnering with Global 1000 companies, emerging businesses, and the investment community from 45 offices on six continents. To join our Growth Partnership, please visit http://www.frost.com.