



RFID (Radio Frequency Identification) landscape definition and opportunities for BearingPoint Inc.

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Abstract

The project was undertaken for BearingPoint, one of the leading consulting firms in the world. BearingPoint is headquartered in McLean, Virginia and its expertise extends from business and technology strategy, systems design and integration to managed services. The purpose of the project was to provide the Infrastructure Solutions group within the firm an understanding of the RFID market landscape and identify opportunities for the group in this emerging market.

The team consisted of six team members from the MISM program. The students had prior experience in consulting and systems integration in industries as diverse as manufacturing, telecommunications and financial services. The project took approximately three months during which the team made two presentations to the client at their headquarters as well as submitting a project report with their findings and analysis.

Overview

The hype about RFID is starting to reach a fever pitch. The developments in the RFID space have brought in new product and service offerings to meet customer needs. The new landscape warrants a detailed look at the technology and emerging trends. As a premier technology-consulting firm, BearingPoint intends to position itself to capitalize on the opportunities that this market presents.

The project is a detailed technology and business exploration of the RFID space. The MISM project team conducted a detailed study of RFID technology, system components, current and emerging technology standards and technology implementation issues. Various application industries ranging from 3rd party logistics to retail were looked at in detail to recommend the most attractive industries for Infrastructure Solutions. The team also tracked the latest trends and developments in the RFID space and the key players in the hardware and middleware space. Studying such players is expected to help BearingPoint identify potential partners for their solutions. The team also analyzed issues unique to this market such as security and privacy concerns or policy issues which may impact the industry and suggested risk mitigation strategies for the same.



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The team defined the current market landscape in the RFID consulting and services sector. An analysis of competing firms such as IBM, Accenture and SUN was done as part of the study to identify their positioning in the market and to identify areas where BearingPoint might play a role.

As for the analysis tools, Porter's Five Forces analysis of the RFID consulting industry was conducted to enable BearingPoint gather a dynamic understanding of this fast changing market. Value Chain analysis for the various application industries was done to identify what portions of the value chains are expected to be major adopters and should be targeted within the application industries. As part of the next steps for market readiness, a detailed cost structure of a typical RFID solution was provided to identify the different components that BearingPoint should bear in mind when approaching clients.

The MISM project team delivered the client environment, business problem and the initial findings at the mid-term presentation. The team then delivered a project report which provides comprehensive information resources on the RFID space and also included detailed analyses of the team's findings and the recommended strategy for BearingPoint. The final project results and accomplishments along with recommendations were presented to BearingPoint at the final presentation in early December.

Industry Background

RFID is the used in many applications such as preventing theft of automobiles, collecting tolls without stopping, managing traffic, gaining entrance to buildings, automating parking, controlling access of vehicles to gated communities, corporate campuses and airports, dispensing goods, providing ski lift access, tracking library books, buying hamburgers, and the growing opportunity to track a wealth of assets in supply chain management.

An early work exploring RFID is the landmark paper by Harry Stockman "Communication by Means of Reflected Power", in 1948. October 1948. The 1950s, several technologies related to RFID were being explored such as the long-range transponder systems of "identification, friend or foe" (IFF) for aircraft. The 1980s the greatest interests in RFID development were for transportation, personnel access, and to a lesser extent, for animals. The 1990's were a significant decade for RFID since it saw the wide scale deployment of electronic toll collection in



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the United States. In 21st Century, The growing interest in telemetric and mobile commerce will bring RFID even closer to the consumer. We should expect to see the emergence of standards that would bring us to widely RFID deployment and finally we should see RFID becomes a part of everyday life.

The participants in the RFID market are represented in the supply chain diagram below:



The Hardware Providers represent the tag, tag printer and reader vendors. The Middleware Providers include those who sell RFID specific middleware and software applications that will allow exploiting data or make use of RFID. The Service Providers are consulting companies or those who provide integration services. Finally, the customers for RFID are represented by the different industries that make use of the technology.

Some analysts state that the RFID market accounted for \$964.5 million in 2002, and has grown 8% since 2000 and is forecasted that the RFID market will reach \$4.2 billion in 2008. Most of the movement will concentrate in the hardware market and services.

For hardware providers, currently the more well-known manufacturers have been able to obtain large contracts from well known companies implementing RFID. These companies include Alien Technologies, which is the leading RFID hardware manufacturer providing service to firms such as Gillette and the US army. Another leading company is Matrics, who has recently been bought by Symbol Technologies also has some large customers. Both Alien Technologies and Matrics are relatively small companies that specialize in RFID hardware, but have become prominent players in the market. Savi is a larger company which is also gaining ground in the RFID market. Symbol has recently gained a larger share of the RFID market by acquiring Matrics. Both Savi and Symbol manufacture other products along with RFID. They integrate the RFID systems with their other existing products. The most common integration is between RFID and bar codes. They believe that RFID has a big potential to co-exist with bar-codes. Moreover, these companies also offer consulting services to their clients to design a customized solution for the firms.



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In Middleware Providers space, OATSystems and Manhattan Associates are highly rated because their solutions that are installed today have the capacity to become an enterprise-wide deployment in the future. The platforms giant companies such as SAP, IBM, and Microsoft are poised to become the lead players in the RFID middleware space by providing the capability to deliver an enterprise-wide architecture as well as the integration and business process management that will become essential in RFID deployments.

Team Dynamics

The project team consisted of six people, and there were five specific roles on the team: the project manager, business lead, technical lead, process manager and financial manager. The business and technical lead outlined specific items that needed to be accomplished for each phase. Then each team member volunteered or were assigned items so all the work was evenly distributed.

We determined the project scope by communicating with the contact persons from BearingPoint. In the beginning, the whole team had teleconference calls with the three main BearingPoint representatives every two weeks. Before each meeting the project manager prepared a word document and a power point of our current progress and questions for BearingPoint. Throughout the course of the semester, we spoke with additional sources such as faculty from Carnegie Mellon University and BearingPoint consultants for additional information. We also had frequent email communication with the main BearingPoint contact person for specific questions or concerns. These email communications are primarily handled by the project manager.

The project team had weekly meetings for status updates on the items that each member worked on. For some of the work items, two team members might collaborate and these two members had frequent meetings. There were regular work days in the project room, where each person worked on his or her own part, but everybody worked in the same room. Email was also a common communication channel for sharing resources found. The team set up a Blackboard account for the project and posted all the main deliverables to the site for easy access.

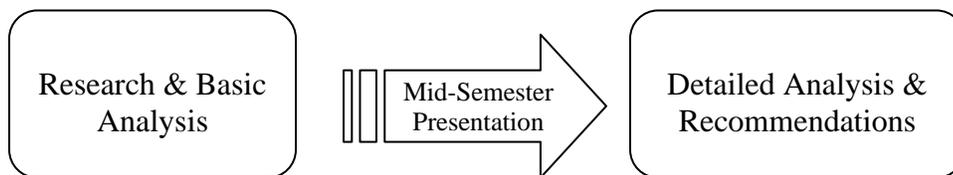


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The team visited the client site around mid-semester for the mid term presentation. We were able to meet with most of the BearingPoint contacts during that time. Also, we visited the client site for the final presentation.

Development Process

The development process of the project was divided into two major phases; research & analysis, and recommendations. These two phases were determined during the initial start of the project and agreed up as an entire group. The goal of the phases was to conduct the majority of the research and basic analysis by the mid-semester presentation and use the remainder of the time to complete the detailed analysis and formulate a specific recommendation for the firm



(1) Defining Scope

The project scope was defined by the joint effort between our team and client. The team wrote the initial project definition while our client reviewed and offered suggestions specific areas of interest. The project was proposed with the two milestones separated into the mid-semester presentation intended to just give an overview of the RFID landscape and the final presentation offering specific recommendations for BearingPoint and the opportunities for the firm in RFID.

(2) Research & Analysis

BearingPoint provided some initial information regarding the Infrastructure Solutions Group and the role of the group within the firm as well as some articles on RFID. The primary role of the client in the research phase was to allow for access to meetings with internal firm RFID resources and also access to Gartner reports. The team researched a wide variety of areas related to RFID through a number of methods including; meetings with professors and clients, industry research and reports such as Gartner and RFID Journal, online research of



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articles and competitor websites, conference calls, diagrams, and internal BearingPoint literature. The primary areas of research focused on the components listed below:

- State of the RFID industry
 - o Market size: existing & potential growth
 - o Market Maturity and trends
 - o Customers
 - o Primary uses
 - o Key players
- RFID Applications
 - o Analysis of eight industries for RFID applications
 - o Case studies
- Technology Fundamentals
 - o Technology background
 - o Standards
- Technology Providers
 - o Hardware suppliers
 - o Middleware providers
- RFID Competitors for BearingPoint
 - o Classifications of competitors: Leaders, Quick Followers, Pure Players
 - o Analysis of competitor positions and offerings
- Challenges to RFID adaptation
- Cost structure of RFID implementations

A review of BearingPoint's existing RFID capabilities and core competencies was also reviewed, however, it was not included an individual section but rather used during the formulation of our recommendations. Once the research was completed, the analysis phase of the project included reviewing all the information we had collected and tying it into a Porter's five forces framework both throughout the presentation as a whole as well as a specific section dedicated to an analysis of the current state of the RFID industry. In specific we analyzed potential industries and uses of RFID, state of competitors, cost – benefit analysis, risks and challenges, and a detailed analysis of case studies, as well as market and target market selection.



(3) Recommendations

The final step of the project was to process this information even further to identify target industries BearingPoint should enter based on the industry and firm characteristics and to determine a framework for providing a comprehensive and scalable solution across industries. The framework detailed the approach and general offerings that BearingPoint should provide when advising on an RFID solution to its clients. Additionally, we completed a list of six steps that BearingPoint should take to further advance their RFID solutions.

(4) Documentation

The team created a comprehensive 120+ page document detailing out the RFID landscape, opportunities, and detailed recommendations for the firm. This document was completed concurrently during the research, analysis, and recommendations phases of our project. The document was geared towards both manager level and analyst level audiences. It provided a detailed table of contents for additional information regarding a specific area as well as higher level information for managers. This document was included in our final deliverables to the client.

Project Retrospective

The first big challenge of this project was planning, because the topic is broad and so it is hard to select the different aspects that we had to analyze. However, setting a project plan and assigning roles for each research area helped get a handle on the subject. Also, regular team meetings were held to discuss the direction of the research as new material and sources came to light.

The second half of the project was devoted to the analysis. The challenge here was choosing the right approach to perform this activity. We tried to look for frameworks in which we could embed all the areas of research. We used Porter's Five Forces analysis for understanding the RFID consulting industry. However, we decided to use customized frameworks in different parts of the analysis and with different purposes. For the same reason coming up with a set of recommendations not following any academic framework seemed unstructured, but using our own creativity was fine and the client was satisfied.



The fact that RFID market is still being defined makes conclusions difficult. A lot of data is based on forecasts by different entities, which usually make different assumptions and so data is also different. Compiling all sources of information and matching them was also a challenge. We even had to make changes as more news came out and new articles were published. In terms of sources of information, the fact that a significant portion of our research was based on the internet also made the work vulnerable.

An improvement area could be made in the communication dynamics with the client. This type of project is very much like consulting, especially because we were trying to add value to the client and not limit our work to find facts about RFID. Our understanding of the client situation was limited by public domain knowledge and the information gleaned from client calls, so we produced a set of recommendations that could have been fine tuned further. It is hard to get client insight only through bi-weekly conference calls. Better access to other resources, more frequent calls or personal communication is advisable for future projects.

Finally, beating all the challenges mentioned above, the deliverables were completed in a timely and satisfactory manner for the team and the client.

Conclusion

Our team has accomplished the goals initially defined in the proposal. In addition to doing the research on the technology and the market, we have conducted an analysis using strategy frameworks in order to better define the market opportunities for the client. Our demanding client was impressed by the nature of the research, analysis and the strategic recommendations provided by the team to capitalize on the opportunities in the RFID consulting business.

Based on the research and analysis that has been done so far, we have defined the possible future work as follows:

Research:

- Intensive research on RFID technical and operational issues
- Research on how ISO and EPC standards can converge
- Making sense of RFID data (Business Intelligence applications of RFID)



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Analysis and recommendation:

- Business case analysis – typical RFID implementation scenario
- In-depth financial and cost-benefit analysis

BearingPoint can use the research and analysis that came out of our project in order to further develop an RFID consulting business model for each market segment recommended in our report. Taking advantage of their internal strength and resources, BearingPoint can build their competitive strategic plan for RFID consulting services based on our research and recommendations.

They can build their long term strategies as follows to further strengthen their leading position in consulting business and to differentiate their solutions and services from the competitors:

- Push for a stronger relationship with EPCglobal.
- Increase the internal RFID knowledge base by training the workforce in Auto ID standards and technologies and by leveraging the expertise of Supply Chain Management Solutions.
- Build and maintain strong relationships with RFID hardware and middleware vendors.
- Target the retail, third party logistics and aerospace industries and build tailored solutions for these targeted industries.
- Increase client awareness of RFID by running pilots.

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