2016 State of RFID Adoption Among U.S. Apparel Retailers

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<u>Introduction</u>

Each June for the past six years, the Auburn University RFID Lab has analyzed RFID adoption by U.S. apparel retailers. The analysis is based on publicly available information and the lab's work with various retailers. As such, the analysis provides a reliable snapshot of both new and existing adopters. Following an initial three years of slow adoption due primarily to the great recession and issues with patent enforcement agencies, the past three years have witnessed growth in both the number of adopters and movement up the adoption curve. The adoption is occurring across all types of retailers —from large department store chains to smaller specialty shops, though mostly in the apparel sector.

In this paper, we look at the 2016 adoption including where retailers are in the adoption cycle and the changes since 2015. We also provide insight into the reasons behind the changes and the factors that may impact 2017 adoption.

<u>The 2016 State of Retail Adoption</u>

Our analysis represents a snapshot in time, taken each June for the past six years. As such, it provides insight, using a consistent annual point in time and adoption model, into the current adoption of RFID by U.S. apparel retailers. Furthermore, because adoption generally occurs first among larger retailers (or retail chains), our analysis focuses on the top 100 U.S. apparel retailers. Our findings are based on publicly available information and our own work with retailers (that may not be known publicly); thus, it is likely some retail use of RFID has been omitted (i.e., if we do not have firsthand knowledge of the use or it has not been reported publicly). Thus, our analysis should be considered conservative.

While there are many ways to view adoption, we empirically developed the adoption map illustrated in Figure 1. As shown, there are five phases we have identified. A *feasibility assessment* is an early stage assessment by a retailer as to whether or not RFID is a viable technology. Several years ago, this phase often took several months as retailers had to determine if RFID was technically effective. Now, RFID is a proven technology; thus, retailers spend very little time investigating the question: does RFID work? Subsequently, it is rare to find a retailer who spends more than a brief time in this phase. Most retailers who are seriously contemplating the use of RFID move quickly through this phase to the proof of concept phase.

A *proof of concept (POC)*, which typically involves one or two stores and a limited number of merchandise categories, is designed to demonstrate RFID's effectiveness in the retailer's environment. Retailers often spend three to 12 months conducting POCs. During the POC, retailers will utilize RFID to address major use cases. Various types of RFID readers (e.g., handheld, door portals, overhead) may be used to determine the correct portfolio of technology to solve their problems. Generally, POCs tend to focus heavily on technical and implementation feasibility and process change. POCs do not normally include matched control

stores to validate the business case, and many of the ROI metrics and financial success reporting are usually left until the pilot stage.

The next step is a *pilot*, which generally involves more test stores, categories, and the use of matched control stores to help isolate the RFID effect. The goal is to determine if the RFID application and the resulting benefits can scale and to validate the business case including ROI metrics. Think of this phase as a POC on steroids. The learnings from the POC are examined in a much broader scale – both in the number of items and in the number of stores. This phase is essential for a retailer to determine the road map for RFID for their organization going forward. Retailers will spend at least six months in pilot and it is not unusual to have pilots lasting more than one year.

If the pilot is successful, retailers move to *phased deployment*. In most cases, it is not possible to RFID-enable (including infrastructure and tagging) all items in all stores all at one time. Rather, retailers phase-in the use of RFID using one of two common strategies. Large department stores typically roll out an RFID infrastructure to the entire chain in one or more categories; adding more categories over time. Specialty retailers tend to RFID-enable an entire store one at a time, until all stores are RFID-enabled. Both are planned, phased roll-outs of RFID. Retailers can spend a year or more in a phased roll-out.

Finally, at the end of a phased roll-out retailers reach *full deployment*. Full deployment indicates all items in all stores. This is a very high bar to reach, especially for a large retailer. Thus, we see very few retailers at this stage currently.

2016 Adoption

Figure 1 shows the stages of adoption of U.S. retailers currently investigating RFID solutions. Of those with RFID projects, about a third (35%) are conducting POCs. As mentioned previously, POCs are a very important step for the retailer and should not be overlooked. A properly executed POC can provide the insight necessary for a retailer to make an informed decision whether or not to move to a more extensive pilot.

An estimated 22% are currently conducting pilots. Pilots run the gamut from a few stores with several categories to several stores with all items. Typical use cases include inventory accuracy, out of stock reduction, loss detection, and locating product. A few pilots examine more advanced use cases such as enhancing the customer experience and enabling key omnichannel capabilities such as ship-from-store (SfS) and buy-online-pickup-in-store (BOPIS).

A bit surprising this year is the large percentage (39%) of retailers in phased deployment. As retailers successfully completed pilots the past few years, the natural progression is to phased deployment. This set of phased deployments include some specialty retailers who are tagging everything (or almost everything) in their stores and are rolling out store by store as well as some large department stores who are RFID-enabling all their stores for a few categories (such

as denim, women's undergarments, shoes, etc.). This year, we witnessed more of the latter (i.e., large department stores) than the former (i.e., specialty retailers).

The final phase of adoption – full deployment – only has a few retailers at this time. As noted earlier, this is a very high bar, indicating the use of RFID across the entire retailer's chain for all items.
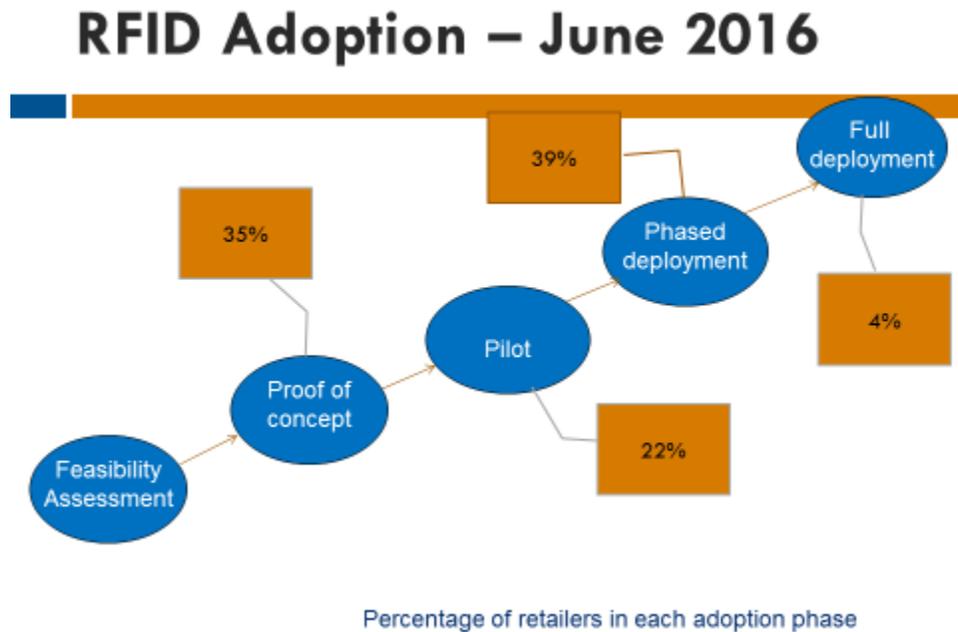
RFID Adoption – June 2016

Feasibility Assessment → Proof of concept (35%) → Pilot (22%) → Phased deployment (39%) → Full deployment (4%)

Percentage of retailers in each adoption phase

Figure 1: U.S. Apparel Retail Adoption of RFID, by Adoption Phase

Figure 2 illustrates the percentage increase in each adoption phase from 2015 to 2016. Overall, new retailers adopting RFID increased a whopping 32 percent from 2015 to 2016. Many of these are new entrants conducting POCs, with a 42% growth in retailers doing POCs. Many of the retailers conducting POCs last year moved to pilots this year (57% growth). The relatively small percentage increase in phased deployment (18%) was most likely due to the extensions of existing pilots or the necessary considerations inside the retailer to embark on a more extensive use of RFID (this internal discussion can often take months, often delayed to coincide with the start of a new fiscal year). While we did see a doubling (100% increase) of those at full deployment, this is a small number of retailers and should be interpreted accordingly.

RFID Adoption – June 2016

+18%

+42%

+100%

Full deployment

Phased deployment

Pilot

Proof of concept

+57%

Feasibility Assessment
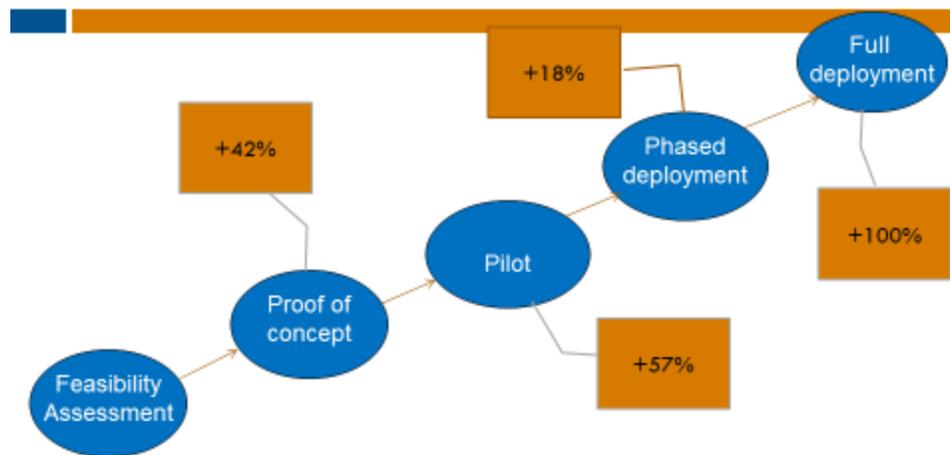
2016 v. 2015 percentage increase in number of retailers in a particular adoption phase.

Overall increase = 32% more retailers using RFID in 2016 compared to 2015

Figure 2: Growth in U.S. Apparel Retail Adoption of RFID, by Adoption Phase, 2015-2016

Key Factors Currently Influencing Adoption

Growth in adoption from 2014 to 2015 was 23%; this year it is 32%. The accelerating rate of adoption continues to be driven, in our opinion, by the requirements of being an omnichannel retailer. Specifically, inventory accuracy is a requirement for omnichannel and retailers simply cannot efficiently achieve a high level of inventory accuracy without RFID.

The 2015 holiday season was a wake-up call for many retailers who thought they were omnichannel ready. Unfortunately, most were not. Failures in BOPIS, SfS, and the inability to provide visibility to the individual unit for consumers were common missteps. The majority of these issues is caused by poor inventory accuracy – a problem that has plagued retailers for decades. RFID provides the only verified viable solution, hence its recent popularity.

In the near future, some factors that will positively influence adoption include:
1. Tagging at source. As more brand owners tag at source, more retailers will have RFID-tagged product flowing through their stores which will prompt some non-RFID retailers to start RFID projects.
2. Expanding categories. Apparel, especially denim and women's undergarments, has been the focus of RFID adoption to date. We are starting to see new categories, such as electronics, automotive, and sporting goods, which will further drive adoption.
3. Utilizing data for entire supply chain and sharing data among all supply chain participants. Recent adoption has been focused on in-store use cases. As the use of

RFID necessary moves up the supply chain (to tagging at source), the data sharing among all supply chain participants will be necessary to achieve full value for all participants. This means that retailers must be willing to share data with their brand owners, and vice versa.

4. Portfolio of RFID reader solutions. RFID reader solutions to a variety of major use cases are now available. Depending on the needs of the retailer or the brand owner, handhelds, door portals, overhead/zone readers, autonomous units (such as robots), and wearables are all available. Choosing the right technology portfolio is essential to solving the problems.

Potential Headwinds

Amongst the good adoption news, there are some headwinds which have slowed the move along the adoption curve for a few retailers and have caused some retailers to postpone their RFID adoption. We currently see three primary issues:

1. Treating RFID as a 'project'. In discussions with some retailers, RFID has been viewed as a project alongside other projects such as omnichannel enablement (such as BOPIS and SfS). As an example, one retailer decided to postpone their RFID project so they could focus on BOPIS. The irony, of course, is that a retailer must have high inventory accuracy to have a successful BOPIS program and the best way to achieve high inventory accuracy is with RFID. RFID should not be viewed as a 'project' – rather, it should be viewed as foundational to enable many of the projects retailers must undertake to adequately satisfy today's consumer.

2. No or poor execution. The scenario goes something like this: "we (the retailer) installed RFID and now have high inventory accuracy, but our shrink has not decreased and sales have not improved." How is this possible? The answer is simple – a retailer must do something with this data. High inventory accuracy (and visibility) does nothing to directly solve the problems unless a retailer does something with this information. Did they use the visibility to improve replenishment? Did they expose more inventory to consumers? Did they implement a loss prevention system with this new visibility?

3. Poor analysis of POC or pilot results. As a retailer enters a POC or pilot, it is important to determine the major use cases prior to the start of the project. Furthermore, retailers must take good pre-RFID measures of the key indicators, such as inventory accuracy and out of stocks, and choose control (non-RFID) stores to compare to the test (RFID) stores. For the control stores, we recommend using a matched-pair approach whereby one control store is chosen for each test store using a set of key matching criteria (such as geographic location, store traffic, sales, size of store, turnover, etc.). Control stores should be chosen prior to project initiation. If conducted properly, a pre vs. post and test vs. control approach should provide good insight into the value of RFID. In recent years, some retailers have adopted third party data analysis or test and learn tools to help analyze their business case. Unfortunately, some third party tools use post-selected or one-to-many control matching, which, in our opinion, will not yield valid results for

transformational initiatives, such as an RFID implementation. RFID creates a permanent change in inventory accuracy, sales, and other metrics. Using post-selected or one-to-many control sampling simply moves the test stores to comparison against a set of higher performance control stores, and the final results can provide inaccurate conclusions (i.e., by post-selecting the control stores, there may appear to be no difference between the test and control stores).

Conclusion

The 2016 study reveals a pattern of movement expected in a healthy adoption environment. Overall, growth from 2015 to 2016 (32%) exceeded the previous year's growth (23%). There are several indicators suggesting adoption growth should be strong in 2017 as well. However, some headwinds could have a chilling effect on adoption, although all can be easily addressed by adopters. Viewed holistically, though, we expect the number of new adopters for the upcoming year to exceed this year's growth, and the move up the adoption curve to continue its healthy pattern.