Executive Summary

American Apparel successfully piloted RFID at the item level and, once funding is secured, expects to roll out RFID to all of its 260 stores over the next eighteen months. Our analysis suggests the per-store payback on the RFID project is about 4.5 months given increased sales from fewer out-of-stocks and reduced labor. RFID boosted revenue by providing improved inventory visibility and automation that enabled process changes to ensure a full complement of product offerings were available on the retail floor at all times. This was accomplished with reduced labor for weekly cycle counts and inventory searches. The company began a proof-of-concept test in one store to validate RFID could help improve out-of-stock inventory, and the project was later increased to eight stores to conduct a full pilot.

Company Profile

American Apparel, headquartered in Los Angeles, California manufactures, distributes, and sells at retail basic fashion apparel for men, women, and children. The company primarily offers t-shirts, denim, sweaters, jackets, and other casual wear at its roughly 260 retail stores in the United States, Canada, Mexico, Europe and Asia. American Apparel also owns a wholesale business that supplies t-shirts and other casual wear to distributors and screen printers and sells goods on line. All manufacturing is done at a single location in Los Angeles where the company produces roughly 1.5M apparel pieces per week. The company generated revenue of $545.1M in 2008, or growth of 41%. At retail, where the RFID system is used, revenue was $382.4M in 2008, which grew 58%. Comparable store sales were up 21% in 2008, and the company saw good expansion, adding 78 net new stores worldwide. However, given the challenging retail environment, where same-store sales are now down, American Apparel is being cautious with its capital spending budget in 2009 with $20M-$25M in planned expenditures versus $68.7M in 2008, suggesting project funding will be selective.

Each company store has on average roughly 12,000 stock keeping units (SKU) on its retail floor, and it is company policy to have only one of each SKU on the retail floor at all times. Replenishment inventory is housed in the store stockroom, typically located in the basement. In total, the average store has about 38,000 items, with about 12,000 on the store floor and 26,000 in the stock room. Once
an item is sold, company policy requires store personnel to immediately replace that item on the retail floor shelves or clothing rack. Replenishment orders to the factory are generated daily based on the goods that are transferred to the retail floor. Today, this process relies on bar code scanning to perform inventory transfers from the stockroom to the retail floor and on scanning data at point-of-sale.

In order to ensure compliance with company policy of a full complement of inventory on the retail floor, store personnel perform a twice-per-week physical inventory count by visually inspecting each rack or shelf. Historically, any missing items are physically circled on a copy of the store inventory checklist. Physical inventory counts and sales floor inventory replenishment historically require about 240 man hours each month to perform. With this system, about 100-300 items on average are discovered to be missing at each cycle count.

Pilot Approach

Given the relatively higher-than-desired number of missing items at retail, the company became concerned with potential lost sales due to out-of-stocks, and began to evaluate RFID as a potential solution. The company initially fitted its Columbia University store in New York in November of 2007 as a test pilot to confirm the technology would work. The company elected to use UHF Gen 2 technology given the automated nature, and deployed two tabletop antennas from Vue with two fixed Motorola XR440 readers in its storeroom, and one Vue antenna and a Motorola XR440 fixed reader between the store room and the retail floor and two Vue tabletop antennas and a fixed Motorola XR440 reader at point-of-sale. The tabletop readers were fitted with homemade “bucket” housings to direct the RF energy thus eliminating false reads outside of the desired read zones. All existing store inventory was tagged manually. American Apparel employed Vue’s TrueVue software platform for the trial. Tags were Avery Dennison’s AD-222 hang tag.

In terms of process flow, new merchandise is tagged at the factory or manually upon arrival at the store. Note that since American Apparel is a vertically integrated manufacturer, it is easier to source tag at manufacturing, including commissioning to associate the item with the tag. While not critical to driving value for this project, we view this as a key enabler for incremental supply chain applications that could provide increased value in the future. Upon arrival, each article is scanned with an RFID reader to receive the item. Once this process is complete, goods are moved into general store-room inventory. Replenishment for the retail floor is triggered by the sale of an item, where the RFID tag is read at point-of-sale (POS). Each RFID tag can provide information on a specific item when read at POS, which may enable future help with merchandising or loss prevention. Previously, this information was generated with a bar code scan. Please note, the company is seeking to reuse a portion of tags, and once removed from the item, they are housed in a metallic container next to the POS station to prevent unwanted re-reads.

The POS process provides an alert in the store-room that an item must be replaced on the retail floor. Storeroom personnel pick the item from inventory, and read the item’s RFID tag on a second RFID-enabled table in the storeroom, which confirms to the application software, RetailPro, that the item is moved from stock inventory to staging for retail replenishment. Each item is placed on a hanger or properly folded at the staging area. Once a sufficient number of items have been properly staged, they are moved to the retail floor, where a reader located between the store room and retail floor reads items in transit and compares them against the staging inventory. A monitor allows personnel conducting the inventory transport to visually confirm the correct items are being moved to retail to ensure proper replenishment. Once confirmed by transport personnel, the system updates the retail floor and staging inventory in RetailPro. The previous process of staging and moving goods to the retail floor required manually scanning each bar-code tag, which necessitated more time and provided less ability to confirm the proper replenishment process.

Benefits Achieved

As a result of the RFID process, inventory is updated more frequently with less manual intervention. The system provides a real-time view to store managers and senior management regarding out-of-stock positions in aggregate or by store, allowing for corrective action as needed. Further, management gets a more up-to-date look at merchandising trends. American Apparel has indicated that inventory accuracy from the system is running above
99%. To provide some context, prior to the project, management estimated American Apparel was suffering from 10% in lost stock, and once the visibility was improved with RFID, they discovered the problem of lost stock was actually closer to 20%.

At each store, Motorola MC-9090 handheld readers allow store personnel to perform bi-weekly cycle counts and associated inventory replenishment using about 52 man-hours per month, versus the manual process, which took roughly 200 hours per month for two general weekly cycle counts and sales floor inventory replenishment, plus an additional 40 hours per month for selected styles cycle counting. Total labor savings are 188 hours per month, which will require fewer people to man each store. In addition, management indicated stock room associates were only spending 50% of their time on stockroom organization and transfers as cycle counting required 50% of their time. With the RFID-based system, 75% of time can be spent on tasks that help improve revenue, including faster receipts, stock room organization, transfers and customer service. Given these efficiencies, American Apparel is able to manage two stores for every “store manager” compared to a one-to-one ratio for traditional stores.

As a result of the system, each store has fewer out-of-stock items, down below 10 per cycle count, and sales have increased just over 14% per square foot on average. The methodology employed to determine the revenue increase was to compare revenue from the eight RFID implemented stores against two sets of metrics-against the same eight stores for the same time period a year earlier (adjusted for cannibalization from new American Apparel store openings), and against similar non-RFID stores in the same geographic region. The two high and low outliers were discarded and the remaining store average demonstrated an increase of 14.4%.

Pilot Challenges
AS PART OF THE process, the company uncovered several initial challenges, including basic employee training, modest process changes and equipment layout. Given American Apparel’s relatively younger store employee base, the technology training was relatively well accepted and successful. With respect to process changes, there were a few added steps, such as tag commissioning, and a few variations on existing processes, such as moving items around when scanning to ensure full reads. With respect to equipment layout, key issues included outfitting tables with housings to direct RF energy, reader mounting, and cabling and changes to metal shelving to ensure tags could be read. The shelving issue was solved with a low-cost layer of bubble-wrap and particle board which created an effective air-gap between the tag and shelf.

With the one store, the company found success with its RFID system and was able to overcome early obstacles. However, the company believed that a true pilot would need to be conducted in many stores simultaneously to understand all the key issues and how they would be managed. This is particularly true as stores are in many different locations, have diverse sizes, varying traffic patterns and offer a unique assortment of merchandise. The company outfitted seven additional stores (six in New York and one in Santa Monica, California), and found several additional challenges to be overcome, including systems management, data aggregation and scalability.

With multiple stores open, the IT department could no longer focus on just one store and take rapid corrective actions. Systems management needed to be centralized, store personnel had to be further trained and third-party support was required for servicing. The company also realized that software updates and provisioning would need to be centrally done, rather than terminal-by-terminal, which would be overly time-consuming. The new implementation saw a large and regular number of “emergency calls.” After only a few months, the number of these calls dropped significantly as the American Apparel staff addressed these issues and further institutionalized the RFID process. The staff now has good knowledge of what will be required to fully deploy the system.

RFID Value Add - ROI Analysis
AFTER RUNNING with eight stores fully since November 2008, American Apparel was able to assess its RFID system against its existing technologies and processes. The analysis shows an average payback of roughly 4.5 months per store. On average, sales per store increased 14% as a result of more key items in stock (fewer out-of-stocks) and given store personnel had more time to interface with customers. Further, each store saved over 188 hours per month in labor given reduced cycle counting and storeroom search time. Based upon American Apparel’s average mature store revenue,
found in the company’s most recent 10-K filing, and our estimates, we forecast an average store net operating income benefit (tax adjusted) of $126,900 in its first year of implementation. The initial investment was about $47,400 per store, which included the original tag fitting, the readers, associated equipment and installation, the software, and initial training and store inefficiencies.

With respect to our analysis, we worked with American Apparel to determine several key inputs, extracted information from investor presentations and the 2008 American Apparel 10-K filing with the Securities and Exchange Commission. We also made some additional assumptions on our own. In terms of benefits, we applied the 14% revenue increase to average retail store sales and boosted gross profit by the average retail margin in 2008 of 65.9%. This generated $172,528 in incremental gross profit benefit per store on average. We estimated fully burdened labor to be $12 per hour, which provided annual savings of $27,072 per store on average. Our analysis did not assess the potential for better merchandising strategies from incremental data, or evaluate loss prevention applications. With the new system, American Apparel is discovering data that allows the company to hone in on theft, which has already resulted in several recoveries. Further, our analysis does not include any potential benefit by using RFID between the factory and stores or for the returns process and we do not include any potential inventory reductions. Given the vertical nature of American Apparel’s operations, we expect good value can be attained on these incremental applications for a relatively modest incremental expenditure.

The initial costs, which included all hardware, software, cabling, project management, initial training (and associated labor inefficiency) and support costs were calculated to be $47,370. We assumed each store would need on average 72,200 tags per year, given an average item count per store of 38,000 and 1.9x inventory turns each year. We further assumed a 50% reuse rate on the tags. Given this, annual per store tag costs are $2,708. We factored in annual maintenance costs per year equal to 10% of the initial hardware costs, and we assumed $200,000 in annual corporate support costs. We depreciated the initial costs over three years for an annual expense of $15,780; any benefit above this level was taxed at the U.S. corporate tax rate. This was more conservative than simply applying taxation on benefits above the total project cost in the first year; however, if applying this methodology, the payback period would be 0.4 months faster. We also assessed a capital charge of $6,154 based on a 13% cost of capital.

This analysis assumes the system deployment is financed by American Apparel. Our understanding is that a potential lease option exists to include all hardware, software and service costs for $2,700 per month per store over a three-year period. This assumes a residual value on the hardware at roughly 10%-20% of original cost.

**Next Steps**

American Apparel worked in conjunction with Xterprise to develop a scalable software package that also addresses incremental application requirements. Xterprise software is written on top of Microsoft’s BizTalk Platform. This new software was initially tested in a single store in late January for roughly 90 days. American Apparel is now ready to roll out to its entire store base, which is expected to begin this summer. Assuming current economic conditions will permit funding, the rollout would likely begin with 8 pilot stores in the U.S. and an additional 38 in Canada. The company hopes to take advantage of new integrated reader/antenna technology to further lower its initial deployment costs. The company hopes to have all stores complete by the end of 2010.

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**About RFID Monthly**

*RFID Monthly* is published by Reik Read of Robert W. Baird & Co. Read has covered the automatic identification and collection industry for more than 11 years, and has been writing *RFID Monthly* for the past five years. He has been a regular presenter and panelist at RFID industry events, including RFID Journal LIVE!, the EPC Connection Conference, AIM Global’s Showcase and the University of Wisconsin E-business Consortium. Read was also recognized in 2006 among the Best on the Street by The Wall Street Journal, ranking first in the Electronic & Electrical Equipment sector. Read also ranked second in the Electronics category by Forbes in 2008.

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