Section 3: Week 7: Enhancing Physical Shopping with RFID

Nate Bachmeier

TIM-8130: Data Mining

March 22, 2020

North Central University

# Enhancing Shopping Experience with RFID

## Overview and History

Radio Frequency Identifier (RFID) tags provide an economical solution for labeling individual items and tracking their lifecycle. Organizations have been leveraging RFID since World War II, and its popularity has surged due to mass production driving down costs (Bolic et al., 2010). For instance, a retailer can order apples from a supplier then collect per box metrics around the duration to transport and inventory holding times. When a business can monitor the supply chain with precision and granularity, it enables efficiencies across a broad spectrum of scenarios. Consider the costs associated with misplaced inventory as that ties up capital, and once found, those items require discounting. These costs can quickly become factors of magnitude larger than disposable tags, which are only a few cents in volume (Zhang et al., 2018). Alternative solutions, such as bar codes, exist at a lower price point but come with several limitations. A barcode relies on optical readers of static printed patterns, versus RFID does not require line of sight and uses reprogrammable memory. Those enhancements enable advanced scenarios, such as smart containers reporting its unique identifier, the delivery date, and item summary details. A notion of memory segment security exists so that the delivery date cannot be changed—however, removing items updates the counts.

## Project Evolution

Using RFID tags to track inventory through a supply chain, has been mainstream for some time, with many large retailers mandating the practice. More recently, businesses are extending these monitoring pipelines to include floor space and gain insights into their customers' behaviors (Sakuai et al., 2010). Traditional behavior modeling relies on point-of-sale information to understand purchasing decisions. However, with RFID, it becomes possible to track a specific customer picked up a specific garment, tried it on, and did not make the purchase. If the business can understand why the sale did not happen, it can attempt to correct the issue. Perhaps, the desired size was not in stock, and by alerting the customer when more choices are available, it can complete that transaction. Discovering these high probability sales through automated solutions both improves the bottom line and customer satisfaction versus relying on anecdotal evidence.

## Information Generated

## Decisions Using that Information

## Current and Future Advancements