RFID Feasibility and Scoping Report v1.1

Harfords Menswear.

Alan Mayo, Grant Pugh, Bruce Hutchings

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THE NEW ZEALAND
RFID PATHFINDER GROUP

"RFID enables frequent inventory counting, which enables inventory accuracy. You can't be great at omni-channel without having high confidence at the store level, at the size and colour level," - Bill Connell, Macy's senior VP of logistics and operations, 2014

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EXECUTIVE SUMMARY

This report documents the findings of a Feasibility and Scoping Study, undertaken in July 2015, of the potential for RFID-enabled stock tagging and counting in Harfords Menswear. While RFID is technically feasible for Harfords and a solution has been scoped, a final decision to proceed, or not, is dependent on Harfords' judgment of the strategic value of enhanced inventory accuracy.

The study found that RFID-enabled stock-management is technically feasible and designed a solution as described in this document. However, such technical feasibility does not necessitate that this is a sound commercial proposition. The study found that if Harfords maintained its current operations (i.e. same process, including bi-annual stocktakes), the cost savings benefits from RFID were marginal with an NPV of -$6,857 over 5 years on an initial capital investment of $20,000.

But, if Harfords made a strategic decision to aim for high inventory accuracy, through monthly inventory counting, an RFID solution would be the only practical alternative. In such a scenario, RFID cost benefits would be an NPV of +$22,055, with the strategic benefits of increased inventory accuracy being additional. For retailers, such additional benefits would include: trust in the stock numbers held in the inventory system (during the study, inventory appeared to be significantly inaccurate in some product lines); ability to support integrated on-line sales; enablement of auto-ordering processes to operate efficiently; and enablement centralised management of inventory.[1]

Harfords themselves need to judge if the strategic benefits noted above, the cost savings identified in the financial analysis, and future potential would warrant undertaking such a project, and, if so, when such a project should go ahead.

While this study gives no clear cut recommendation because the analysis cannot easily quantify the strategic benefits, it is highly likely that the business case for a chain of apparel stores, with some centralised control, would be significantly more clear cut. Given technical feasibility, accurate centralised inventory figures would likely deliver significant supply chain benefits and cost savings.

Harfords boutique menswear store is a typical premium, high-margin, low-volume menswear retailer. Being a single store business, Harfords applies its own pricing when receiving stock. This provides the ideal point to RFID enable stock, thereby avoiding the need to integrate back up the supply chain for larger businesses who receive priced stock.

Alan Mayo and Grant Pugh would like to thank Richard, Chris and Sonja from Harfords Menswear in Lambton Quay and Bruce Hutching for Kudos for their time and assistance during this study. Kiwi ingenuity is clearly alive and well in the middle of Wellington!

[1] This study has focused on inventory management and, as is clear from off-shore developments, there is scope for sales process enhancements through RFID in apparel. As not being pertinent to Harfords at this time, they have been excluded from the analysis, but are noted here as a potential influencing factor.

KEY FINDINGS

Harfords, like any retailer, could benefit from increased stock accuracy. Regular and accurate stock taking is the fundamental process that RFID, with the direct benefits from system accuracy and downstream benefits of enabling automation processes and integrated eCommerce. Additionally, processes to search for an item, read data directly from the item, and specific scans of stock groups to support specific workflow (mark-downs, remove old-product) would add additional value.

A survey revealed that stock was held in three locations within the store. Approximately 55% of stock is located at the front of store, 29% at the back of store office and 16% in a room upstairs adjacent to the store. Items such as suits are predominately hung on racks or in the case of business shirts, stacked on shelves. Shoes are held at the backroom with some items on display. Analysis concluded that stock counting and finding could be undertaken more efficiently with RFID and it is estimated that approximately a 90% reduction in stocktaking time could be achieved.

Two approaches to implementing RFID solutions were considered: a) a low cost hand portable system wherein staff are equipped with RFID readers to speed up traditional processes such as stock–taking and b) fixed infrastructure which continuously monitors stock levels without staff involvement. Given the level of stock turnover and the cost of infrastructure systems, hand portable systems are recommended as the most cost effective solution. A simple system could be implemented using a single RFID enabled handheld computer and an RFID enabled label printer.

A few representative items in the store such as belts and suits were tagged with RFID labels to identify potential issues with reading tags using handheld readers. No significant issues were found and consequently two RFID enabled labels are proposed, being of a similar size to the pricing label currently in use. Some items such as cufflinks are not suitable for tagging with these labels but the amount of stock involved is small.

RFID labels may be encoded with information extracted directly from the inventory software system for stock identification. In addition each label will carry an automatically generated serial number for stock counting purposes, which later could be used for individual item traceability.

New Software is proposed for a RFID enabled handheld computer to rapidly inventory the store and provide a list of tagged items that can be synchronized to and reconciled with the inventory software system. Cycle counting and variance reports may be incorporated by filtering handheld readings against one or more PLU of interest. New processes for finding stock, for example aged inventory, will be enabled by the proposed software.

The solution will cost approximately $20,000 to implement comprising an RFID enabled handheld computer, RFID enabled printer, software, tags for inventory and commissioning costs.

Annual costs are estimated at about $1,500. Label costs are based on turnover of about 4,000 items per year with pricing based on purchasing in economic quantities to reduce cost.

Implementing such a solution is likely to be a 3-6 month project, primarily driven by lead times to obtain equipment and perform onsite testing. There is an element of software development, but with a sole software provider, Kudos, this process is significantly simplified. Actually go-live could be anywhere from 1 to 6 months, depending on Harfords ability and desire to retag the total stock of the store.

CURRENT STATE

Harfords Menswear, located at 115 Lambton Quay, Wellington, is a premium retail premise with stock stored in three locations. The range, covering apparel, footwear and accessories, is predominantly presented hung or on shelves and when stored, may also be boxed.

Selling, ordering, receiving and stock management processes are executed by the two in-store staff, as and when required. As the business is high-margin and low-volume, processes can be and are predominantly manual without high significant automation.

STOCK LOCATIONS

Stock is held in three locations:

- 'Store' - The Store itself holds stock for sale on display
- 'Backroom' – A back room behind the store which holds footwear, backup stock and odd sizes
- 'Upstairs' – A storage room upstairs accessed via a lift which holds out of season stock and retained sale items.

STOCK

Harfords have approximately 1,700 products (defined by 6 digit PLUs assigned to colour/size variants). Stock can be seen to broadly fit into three types:

core lines	standard shirts and suits sold all year round
seasonal lines	product such as knitwear and coats that vary by season
tailored to order	suits made to order

The study, based on advice from Harfords' management, did not consider product within the display cabinet such as cuff-links, non-core range such as scarfs, gloves and underwear, nor tailored suits.

The study focused on the approximately 1,600 PLUs with an inventory of 2,500-3,000 items based upon recent stock figures and a manual count, stock distribution was:

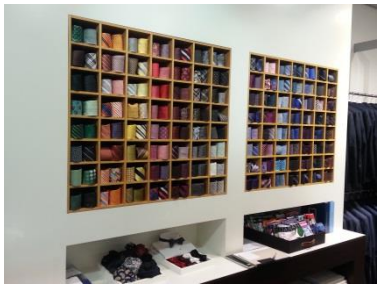
Shirts	37%
Jackets	13%
Trousers	11%
Knitwear	5%
Socks	11%
Ties	16%
Footwear	4%
Belts	4%
Total	**100%**

STORAGE METHODS

Stock is stored in multiple ways:

Hung	jackets, trousers, shirts and knitwear on hangers
Shelved	multiple varieties of: • purpose-built units for ties and shirts • display shelves • storage shelves in the Backroom
Displayed	a table at the front of store and the window display
Boxed	product stored in cardboard boxes

Store



Backroom

Upstairs

An approximate analysis of storage methods shows that:

- Shirts (37% of stock) are both hung and shelved.
- Trousers are shelved as well as hung.
- Footwear is all shelved (in Backroom).
- A significant number of small stored items are boxed.

	Hanging	Shelved	Displayed	Boxed	Total
Shirts	30%	53%	1%	16%	100%
Jackets	97%		3%		100%
Trousers	85%	11%	4%		100%
Knitwear	54%	38%	8%		100%
Socks	28%		3%	69%	100%
Ties		35%	3%	63%	100%
Footwear boxes		100%			100%
Belts	60%		10%	30%	100%
Total	**40%**	**32%**	**3%**	**25%**	**100%**

FOOTWEAR VARIATION

As shown above, Footwear boxes are shelved in the Backroom, but the shoes themselves are either in the store on display or are in the boxes, and are not barcoded. With manual labels on boxes indicating shoes are on display and with relatively low volumes, there are minimal issues.

Given this, the approach taken was to focus on identification of shoe boxes based on continuing the current processes for matching shoes to boxes.

SALES

The sales process is executed by highly professional staff often with repeat customers. As products sold are high to premium quality, single items are normally priced at least three figures. Items sales vary per day from 10-20 items (approximately 4,000 p.a.) and total sales for stores of this type may vary between $500k and $1.5m p.a.

Sales are normally made from stock in the Store, but if required items will be retrieved from the Backroom or Upstairs (the latter especially if a customer wants an out-of-season product).

At sale, all swingers and labels are removed. No Electronic Article Surveillance is used, as theft has not been an issue previously.

ORDERING

Ordering varies from standard lines and seasonal lines. Stock levels for standard lines, such as suits, may be a maximum of one unit. Therefore, the process is often to order what has been sold on a daily basis. For seasonal stock, indent orders are made up to 6-12 months in advance and the stock is delivered in multiple drops throughout the season.

It was observed that the wholesale and distributor network that services Harfords operated in a manner that suited Harfords operations. While there are, no doubt, some issues, the industry is set up to service independent stores that do not have the capacity or desire to maintain large reserve stocks.

The Kudos system, that Harfords utilizes for POS and back office functions, can produce suggested order quantities to purchase. This is not currently used as staff rely on physical counts and their own knowledge of what is selling and their own predictions of what will sell.

INWARDS GOODS

Stock arrives by courier and is stored in a spare changing room. After invoices are checked, items are processed at the POS terminal when times allows (as a premium store, there is normally down-time when administration can occur, unlike a high-volume discount apparel store where such processes tend to be specialized and potentially conducted outside sales time).

Processing of items starts with assigning a new PLU code if required. A price label is them printed and affixed to the swinger or packaging of the item (packaged shirt price labels are affixed to the cardboard behind the collar). The item is then either put in the Store or put away.

STOCK MANAGEMENT

Store replenishment occurs as required and based on the product type. For example, casual hanging shirts may be bought into the store in bulk and compared to the range on display. Stocking decisions are made at that time and the unneeded stock returned.

Stock takes are only performed 6-monthly due to the cost (2 people for 8 hours) and the complexity of stock being in multiple locations (both in the Store itself and also in the three stock locations).

Stock take is performed blind with using a handheld barcode reading device and supported by manual checks:

- 20-40 stock counting locations are defined
- a control sheet lists these locations
- stock is scanned against the location and a manual count is recorded on the control sheet
- once all locations are counted, the contents of the device are downloaded to a PC via USB
- the results are compared to the manual count and any variances resolved (this is the primary purpose the locations, that is, to minimize any variance handling recounts)
- the location data is deleted and the file then imported into Kudos to update the stock

PROCESS ANALYSIS AND DESIGN

This section considers an RFID-enabled stock solution for Harfords primarily from a process perspective. Of course, in practice, the analysis of process and technology opportunities occurred simultaneously. However, the analyses have been presented serially to simplify the documentation process.

The study found that implementing RFID-based stock control was feasible from a process perspective and would likely produce benefits from increased stock accuracy and RFID-enabled searching functions, but some RFID solutions were not practical in this environment.

TAGGING AND FEASIBILITY

A major challenge for RFID implementations is avoiding adding tag application overheads. As stated earlier, Harfords deals with an industry comprised of local manufacturers, distributors and importers. These intermediaries service multiple customers and customer types, hence there is no price labelling at manufacture. Hence, Harfords prints and adds labels product is received. This chook point is an ideal place to apply RFID labels rather than basic price labels. Hence, a major challenge for RFID solutions is avoidable for Harfords.

RFID-ENABLED FUNCTIONS

Stock take	Using hand-held technology, a stock take process could be reduced from 16 hours work to approximately 1 hour, this opening the potential to count the store on a monthly, weekly or even daily basis. Besides the obvious time savings, and perhaps more importantly, are the benefits of improved inventory accuracy. The added functionality in the Kudos system to suggest reorder quantities (essentially showing where stock is missing) could become a significant tool for stock management. If a store such as Harfords wished to promote an e-Commerce solution, increased inventory accuracy would allow an integrated approach where only in-stock items are presented for sale. the financial benefits of such a facility is hard to quantify, but strategically, it may be the enabler required before an e-Commerce solution could be launched.
Find product	While staff normally know where products are, there are occasions where a product gets lost. As a back-up searching method, an RFID reader would enable the store to be searcher and an item far faster than a manual search of the whole store.
Read product details	AS described in the technical design below, additional information can be written to a products tag. An RFID gun can then be used to read and display this information. Such a process is not possible in the data is not currently recorded in the Kudos system and even it was added, this process would be significantly faster to execute.
Specific Scans	Specific scans, especially of the Store, could support current business processes that are relatively complex. For example: • VMI scans for a supplier – by encoding a supplier identifier, a time consuming scan could be made faster and more accurate • mark-downs – identifying a product in a sub-group that requires markdowns would potentially reduce time • identifying old stock – by encoding items age on a tag, old stock (even within for a single PLU) can be identified leading to identification of non-selling lines and/or stock that needs to be exited

SOLUTIONS REJECTED

Location Tracking	In theory, stock could be tracked between the 3 stock locations by appropriate positioning of doorway readers and enhancing the software solution. However, given that the staff have high levels of product location knowledge, the potential for errors when moving stock (heightened when stock is moved in and out of the Backroom in bulk for replenishment), this was rejected as being too complex for an initial launch and unlikely to be a long-term solution.
Sales scanning	POS sales could be triggered by RFID tag reads. This would alter the process with the customer and would require training and trialling. Additionally, a hybrid barcode/RFID or RFID only decision would need to be made and, if the former, would add additional complexity. In consultation with Harfords management, it was agreed to leave this out of an initial specification, but to note this as a potential future enhancement.
Merchandising information	Major apparel retailers monitor specific store areas to discover customer behaviour patterns leading to improved merchandising strategies. Given Harfords hands-on selling process, this has no obvious benefits at this time.
RFID EAS	RFID EAS is possible, but given this that theft is not currently an issue, there is no value at present.

SUMMARY

In the above analysis and high-level design, it has been identified that RFID-enabled stock management is feasible from a process perspective for Harfords and that business benefits would result. Proposed processes are:

- Stock take.
- Finding product.
- Reading product details.
- Scanning stock.

The next section documents the technology analysis that supports the above assertions and defines the required solution design.

TECHNOLOGY DESIGN

Implementations of RFID in retail apparel are broadly divided into two technologies based on the radio frequency of operation: a) Ultra-High Frequency (UHF) and b) High Frequency (HF). The main applications for RFID are stock and inventory management, supply chain logistics, manufacturing process optimization, point of sale operations and merchandising or marketing.

Since around 2007 UHF technology has dominated in the sector because of superior performance, particularly its ability to read many tags, quickly and at long range compared to its HF counterpart. Electronic Article Surveillance (EAS) or "anti-theft" capabilities are built into both forms of the technology. HF offers few benefits over barcoded stock because tags must be read at close proximity but HF forms, now known as Near Field Communications (NFC), are making ground in POS and contactless payment systems. Combined UHF and NFC tags and solutions are starting to emerge in the market to cater for both inventory processes and mobile payment systems but will take some years to mature.

The main applications identified in this document focus on stock and inventory management and for this reason the technology choice concentrates on cost effective UHF solutions.

LABEL AND TAG DESIGN

In general the opportunities for item-level tagging apparel usually occur at the point of manufacture, consolidation points in the supply chain or on receipt of goods into the store. Tags can take the form of labels, RFID enabled swingers or product labels sewn into the garment. Harfords does not control the manufacturing processes of its multiple suppliers so the most feasible opportunity to tag is on receipt of goods into the store by applying a self-adhesive tag (label).

Harfords currently receives its goods and prints and applies a pricing label. The label measures 40 x 30 mm and contains pricing information, and barcoded and human readable version of the stock keeping unit (PLU), a product descriptor including size and colour and manufacturer reordering information. Labels are printed at the sales counter on an Eltron (now Zebra) LP 2428 thermal transfer printer.

Current Labels and Swingers

Current and Proposed Labels

RFID tags for apparel labelling come in two main forms on reels:

1) As a white self adhesive ("white/wet") inlay that can be printed and
2) As a clear self adhesive "clear/wet" inlay used by label makers to convert the tag into a printable label of the precise dimensions required by the customer.

Several labelling options were considered:

a) Use a commercial off the shelf printable white/wet inlay.
b) Retain the existing label and hand place a wet inlay behind it when applying the label to the product.
c) Create a new "converted" label of the desired dimensions.

Option C requires a high turnover of tags (10s of thousands) to justify the setup cost of having the label and tag designed and tooled so this option was discounted.

Option B requires the tag to be separately encoded and combined with the printed label making for a time consuming and error prone process but at low cost since a simple RFID reader writer is required an not an RFID enabled printer but this option was discounted because the labelling process time and effort would negate the gains made elsewhere.

Option A would combine the printing and tag encoding process into effectively the same process already undertaken when the pricing label is produced with the addition that the tag is automatically encoded by an RFID enabled printer at the same time. Choosing an off the shelf label minimizes cost however the choice of label sizes for white/wet inlays from tag manufacturers is usually limited to a few commonly used sizes and this must be taken into account when selecting the tag and meeting Harford's print content requirements. On balance Option A presents the best solution.

Two tags were identified (see Appendix 1), both selected on the basis that they were designed for use with apparel and use a known high performance RFID chip and are available in Australasia. There are a range of additional supply options from other manufacturers that could be considered if price or size constraints become a factor.

TAG READABILITY

A visual inspection of the items suitable for tagging was undertaken to identify potential issues with accurately reading tagged items. The following records our observations:

Group	SubGroup	Likely RFID Performance			
		Hung	Shelved	Displayed	Boxed (1)
Apparel	Coats	OK	OK	OK	OK
Apparel	Jackets	OK	OK	OK	OK
Apparel	Suits	OK	OK	OK	OK
Apparel	Trousers	OK	OK	OK	OK
Apparel	Knitwear	OK	OK	OK	OK
Apparel	Socks	OK	OK	OK	OK
Apparel	Shirts	OK	OK	OK	OK
Apparel	Ties	OK	OK	OK	OK
Apparel	Vests	OK	OK	OK	OK
Apparel	Underwear	OK	OK	OK	OK
Footwear Boxes	Footwear	-	OK	-	-
Other	Belts	OK	OK	OK	CHECK
Other	Accessory	CHECK	CHECK	CHECK	CHECK

Group	SubGroup		Likely RFID Performance		
Other	Jewellery		NO	NO	NO
Other	Leather	CHECK	CHECK	CHECK	CHECK

Note(1), For boxed items, densely packed items may require unpacking to ensure an accurate stock take, otherwise scanning the box should be OK but may need validation tests.

Items marked as check may depend on the individual item or the packing density (in the case of say belts with metal buckles). In the first instance if these items cannot be labelled or placed with a label nearby then they may not be suitable for tagging. Accessories such as handkerchiefs do not carry a swing tag so should be hand counted.

Jewellery items (e.g. cufflinks) do not carry a swing tag and may require one to avoid the label coming in to proximity with the metalwork, if these items are few then they should be counted by hand.

Fabric items with a metallic content such as brocade with metal filaments may cause issues for label tags. Harfords indicated that these fabrics were not common in the store.

TAG ENCODING

A tag encoding format is proposed based on using fields that are already present in the Kudos system which uses PLUs. Details are provided in Appendix 1.

The proposed scheme is broadly similar to the GS1 SGTIN standard which could be used if Harfords wish to use GS1 standard GTINs. If this is the case then the SKU, Season and Group field would combine to form the object class (in GS1 nomenclature) and the store or branch identifier would form part of the EPC Manager number. The AFI in this case is the SGTIN header.

HARDWARE

The choice of RFID infrastructure depends largely on the processes and functions required of the system as well as considerations such as managing process exceptions or overall efficiency improvements to reduce the incidence of say human error or data entry errors. A balance of cost and performance must also be struck.

Two strategies were considered: a) to automate the system so that metrics are produced in real time with minimal requirement for human involvement and b) to equip staff with equipment to undertake the RFID enabled processes currently performed manually but speed up the processes by virtue of the equipment. A comparison of the two approaches is provided below:

Hand portable or desktop Systems	Fixed or Portal Infrastructure
Best Suited to (strengths):	**Best Suited to (strengths):**
Simple operations (cycle counting) Good results in the hands of trained staff. Simple to use Usually straightforward software integration if used analogous to barcodes Finding items Sales scanning Lower capital cost	High stock turnovers, rapid stocktaking When there is high potential for misplaced items Quick identification of apparent out of stock Merchandising, monitoring customer behaviour Frequent stock movement between locations (e.g. back of store to front of store) Rapid visibility of operations suited to dashboards. Specific scans in real time. EAS supported easily
Limitations (weaknesses):	**Limitations (weaknesses):**
Poor operator behaviour leads to poor results, missing areas that are to be scanned, passing over items. Batteries need charging One or more operator procedures needed to transfer data One function or operation at a time. Labour (time and effort) overhead Not suited to EAS	Hard to disguise equipment and maintain store aesthetic Achieving 100% coverage needs front end engineering, adds cost. Often requires specifically designed shelving and fixtures Cabling overheads Larger data handling requirements, more costly and sophisticated software Accurate location services (finding something) carry extra complexity. Require tablet device to view information whilst moving around store. Higher cost

Based on the size of the store and level of operations handheld solutions are likely to be more cost effective. The reader is referred to Appendix 1 for a discussion of infrastructure based solutions.

HAND PORTABLE SOLUTIONS

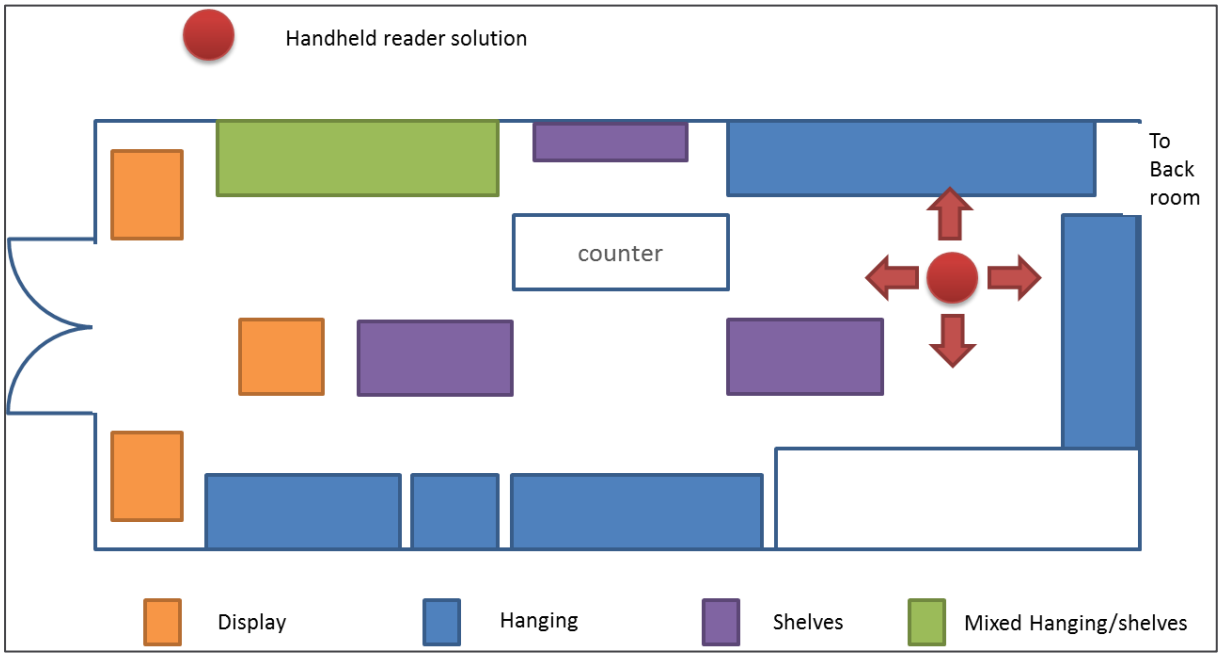
Hand portable systems use handheld computers running application software on the device with an integrated RFID reader. Typically software running on the handheld will be dedicated to a function such as stocktaking or search for stock. Client application software is deployed to the device via a data cradle which also charges the on-board batteries.

The small screen size of the device normally means that applications are designed have a simple look and feel and rely on use of a keypad for data entry or occasional use of a stylus for the touchscreen of the device.

Data transfer from the handheld to the inventory management system is accomplished by docking the device in the cradle, cabled to the computer system then executing a data transfer or synchronization process. Alternatively Wi-Fi enabled devices can synchronize wirelessly or by design automatically send data to the inventory system wirelessly as tags are read.

The essential RFID Processes could be undertaken with hand portable or desktop solutions as follows:

1. Commissioning (goods inwards) use a RFID enabled printer or desktop reader
2. Operations (only the accepted processes such as stocktaking) - handheld reader
3. Stock returns - handheld reader
4. Decommissioning (sale or goods outwards) – handheld or desktop reader



Store Planogram – Handheld Solution

Approximate quantities are as follows:

Item	Description	Quantity	Cost Range
1	RFID Printer	1	$2500-5000
2	Handheld computer, RFID enabled	1	$2500-4500
3	Desktop Reader (optional)	1	$700-1000

TECHNOLOGY SUMMARY AND RECOMMENDATIONS

A hand portable system presents the most affordable solution to implement RFID enabled processes such as stock searches, cycle counts and stock-takes. UHF RFID labels are available in printable formats which can be affixed to the swing tags used by Harfords. An RFID enabled printer should be used to encode the tags.

The recommended label is the 40 x 19 mm ALN-9720 HiScan tag (see Appendix 1). This format is a commonly used in the industry. It is also especially designed for high readability with handheld devices. If the printed information on a Harfords label can be reformatted to fit on this label then this tag should be used.

Garments are well suited to RFID operations because they present little or no impediment to radio signals sent from the reader to the tag, whereas objects with a high metallic content or water content can present problems with read accuracy. An inspection of items in the store and preliminary tests revealed that at approximately 85% or more of the current stock is immediately eligible for tagging and is likely to be read with high accuracy.

The following recommendations are made:

- The ALN-9720 HiScan tag should be used if the printable information on the current label can be reformatted to fit on the label.
- Use of a desktop reader for POS and decommissioning of tags should be deferred until at least other processes are bedded in and processes modified to handle counter operations with many garments on the sales counter
- A combined RFID and barcode imager in a handheld computer is required for store operations. The current recommendation is the MC3190Z (see Appendix 1) based on cost but this should be reviewed when procurement is undertaken because new and improved models are impending.
- Barcode capability in the handheld device is required for backwards compatibility.
- The choice of operating system on the handheld device should be reviewed prior to procurement to validate against software development capabilities and development costs.

In future if garments are supplied with an RFID enabled swinger from the manufacturer Harfords could employ it with potential costs savings on labels. Harfords would need to retain a plain label printer to add pricing information. The existing printer should also be retained for non RFID tagged items (e.g. cufflinks). Consideration should be given to discussing this option with Rembrandt bearing in mind that Rembrandt supply a high proportion of Harfords lines.

SOFTWARE SYSTEM

DESCRIPTION OF CURRENT SYSTEM

Harfords currently use the Counter Intelligence suite of software which comprises of the Back office functions under the Counter Intelligence Office module and the POS functions through Counter Intelligence POS.

The version of Counter Intelligence implemented at Harfords is V2009 Build 183. This version operates on Microsoft SQL Express for Office and Microsoft Jet (Access) at POS. Any future planning for Harfords will centre on V11 of Counter Intelligence which remains with Microsoft SQL for Office but moves to Microsoft LocalDB at POS.

Counter Intelligence is used for inventory control, purchasing, inwards goods, labelling, customer loyalty, point of sale and retail reporting. For a full list of functionality please refer to the website at www.kudos.co.nz

New styles are created in Counter Intelligence Office and where applicable these will carry colour and size attributes. The system allocates unique PLU numbers to the Style/Colour/Size levels.

RECEIPTING GOODS

As goods are received they are received via the inwards goods module where the quantities and costs are entered. Retail prices may also be set or monitored to ensure that the margins are set at the desired level. As a by-product of making the delivery the requisite number of labels can be printed to the label printer.

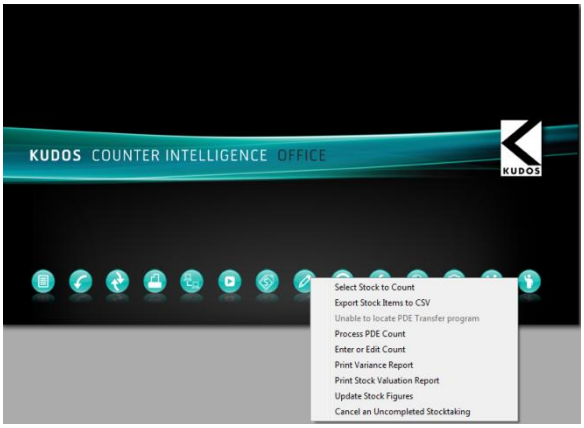
The PLU number (shown as 001118 below) is represented on the label as an interleaved 2 of 5 barcode (sample below).

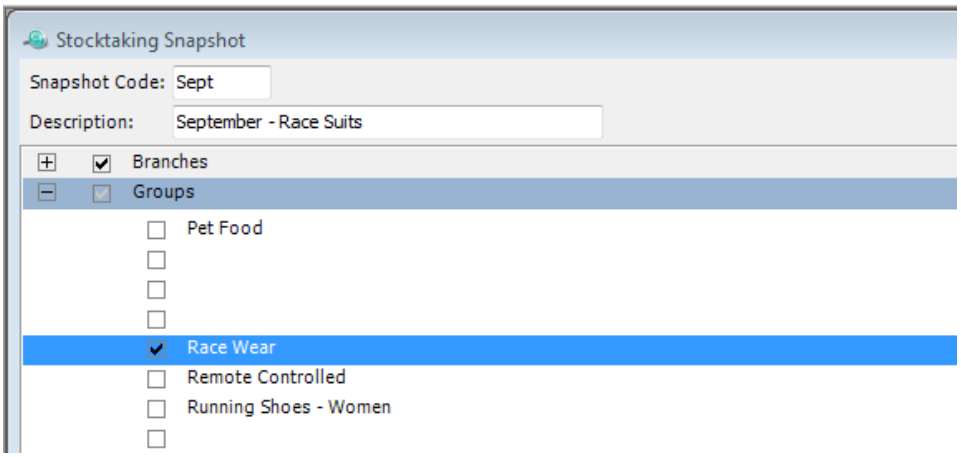
CYCLE COUNTING AND VARIANCE REPORTING

Counter Intelligence has a versatile stock taking module.

The option Export Stock Items to CSV is only available in Version 11 of Counter Intelligence and uploads to a Windows CE enabled Honeywell 5100 Scanner. This enables scan verification during the stock taking process)

A snapshot may be taken of stock on- hand and the snapshot may be selected according to different criteria:



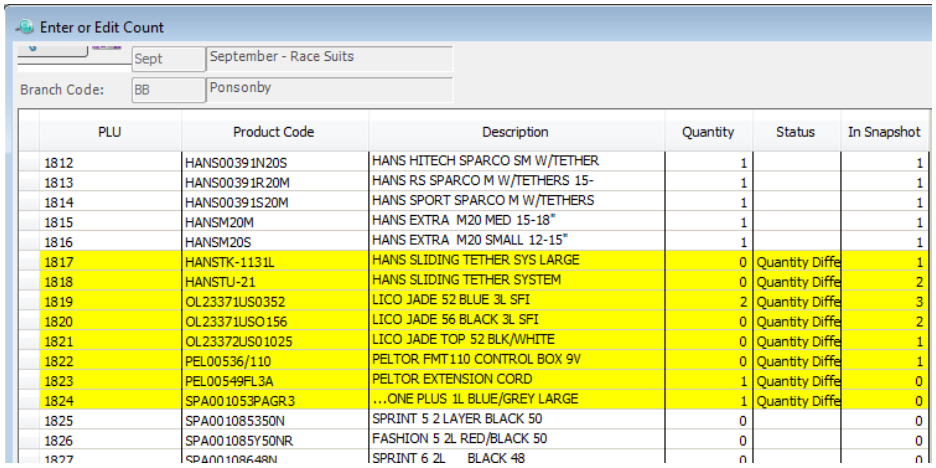


A snapshot of this point in time is then written to file.

Stocktaking may be carried out manually although most retailers will use a PDT unit to do the scan. Harfords have such a unit in the form of a Metrologic S Scanner..

When the stock has been scanned the scanner is returned to the cradle and the count is uploaded to the PC. Counter Intelligence then compares the count received from the scanner to that in the Snapshot.

A screen enables the count be viewed and different coloured bands signify the status of each line – see the sample below:

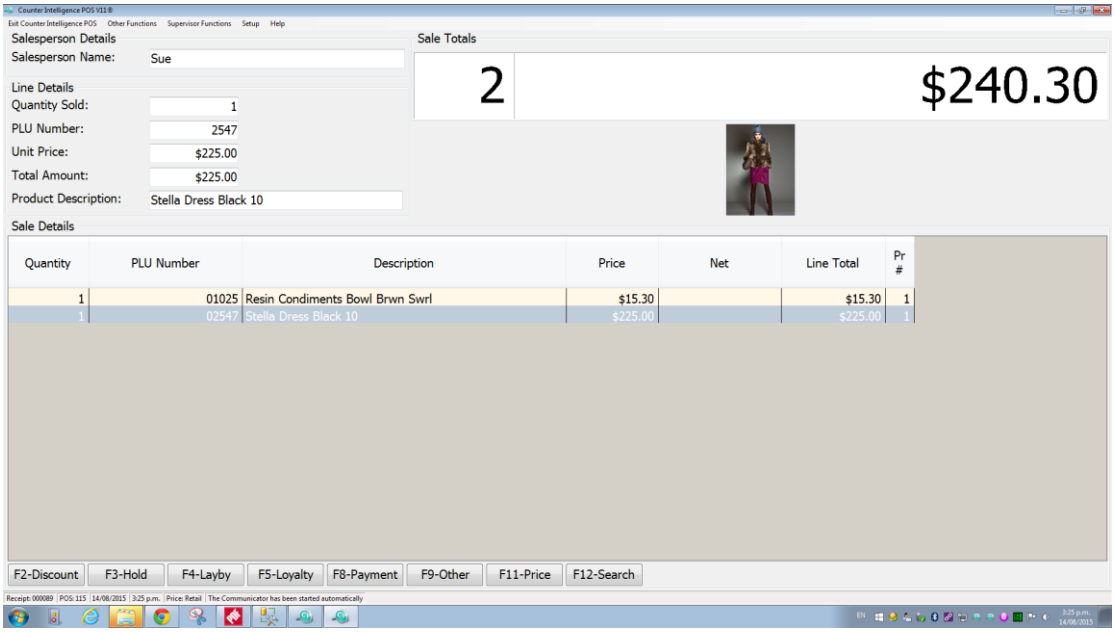


PLU	Product Code	Description	Quantity	Status	In Snapshot
1812	HANS00391N20S	HANS HITECH SPARCO SM W/TETHER	1		1
1813	HANS00391R20M	HANS RS SPARCO M W/TETHERS 15-	1		1
1814	HANS00391S20M	HANS SPORT SPARCO M W/TETHERS	1		1
1815	HANSM20M	HANS EXTRA M20 MED 15-18"	1		1
1816	HANSM20S	HANS EXTRA M20 SMALL 12-15"	1		1
1817	HANSTK-1131L	HANS SLIDING TETHER SYS LARGE	0	Quantity Diffe	1
1818	HANSTU-21	HANS SLIDING TETHER SYSTEM	0	Quantity Diffe	2
1819	OL23371US0352	LICO JADE 52 BLUE 3L SFI	2	Quantity Diffe	3
1820	OL23371USO156	LICO JADE 56 BLACK 3L SFI	0	Quantity Diffe	2
1821	OL23372US01025	LICO JADE TOP 52 BLK/WHITE	0	Quantity Diffe	1
1822	PEL00536/110	PELTOR FMT110 CONTROL BOX 9V	0	Quantity Diffe	1
1823	PEL00549FL3A	PELTOR EXTENSION CORD	1	Quantity Diffe	0
1824	SPA001053PAGR3	...ONE PLUS 1L BLUE/GREY LARGE	1	Quantity Diffe	0
1825	SPA001085350N	SPRINT 5 2 LAYER BLACK 50	0		0
1826	SPA001085Y50NR	FASHION 5 2L RED/BLACK 50	0		0
1827	SPA00108648N	SPRINT 6 2L BLACK 48	0		0

Subsequent steps in the cycle will allow a variance report to be produced and ultimately the differences will be written to file as stock adjustments.

SALE

Counter Intelligence POS is used to transact sales. The labels produced as a by-product of inwards goods have a unique PLU that is represented in barcode format. This bar code is scanned at POS with a 1D laser scanner.



A typical sales screen

HIGH LEVEL SOFTWARE REQUIREMENTS

A high level description of software requirements is provided in Appendix 1. Requirements should be reviewed and refined at an early stage in the implementation phase.

The following software needs are identified:

1. Modification to the labelling process to include the simultaneous encoding and printing of the RFID enabled label.
2. Software to run on the RFID enabled handheld computer to undertake inventory operations
3. Software to run on the RFID enabled handheld computer to undertake product search and find
4. Software to upload data captured on the handheld computer to the inventory system
5. Software to create cycle counting filters for inventory and filters for product search.

COST SUMMARY

CAPITAL INVESTMENT

Costs are estimated for the outlay on equipment and software. Prices exclude GST:

Item	Cost	Supplier
RID Hand-Held Terminal	$4,125	Kudos
Accessories (cradle, cabling etc.)	$365	Kudos
Printer	$3,975	Kudos
Kudos Software Development	$1,720	Kudos
RFID Scanner Software Development	$5,000-7,000	Outsourced by Kudos
RFID Consultancy	$1,000-3,000	Tracient
Initial Tagging	8,000 tags @ $0.25 per tag	Tracient
Total	~18,000 - $22,000	

Software development costs are estimated based on outsourced development of 1-2 applications for the MC3190Z estimated at around 50-100hours of development using existing software as the starting point. Further refinement is possible with more definitive software specifications in place.

RFID consulting costs include for example: support for further gathering software development requirements, bedding in of in-store processes, validation tests on tags etc.

ONGOING COSTS

Item	Cost
RID Hand-Held Terminal ,(Onecare SLA)	$400
Printer (ribbons etc), (Onecare SLA)	$200
Tags	4,000 tags @ $0.25 per tag

Tag Inlays are generally purchased on large reels of 10,000 or more and these are usually recast onto smaller carrier reels of the correct size and width to fit the printer. Purchasing full reels offers the most economic purchasing quantity. Given that Harfords tagging requirements are of the order of 8,000 tags initially with an annual requirement of about 4000 then smaller purchasing quantities may result in a slight but acceptable increase on base pricing. Small order quantities (of the order of 1000) will carry a premium of about $0.05 - $0.08 per tag. Costs could be managed by investing in a reel and have it held by the agency that casts the reel onto smaller rolls for the printer.

FINANCIAL ANALYSIS

Quantifying the case for RFID focuses on costs and cost savings, as benefits from enhanced processes and enhanced accuracy would be at best guesses and at worst, bad guesses. However, even with this limitation of focusing only on one side of the ledger, it is possible to distinguish two cases:

Current State	Simply using RFID to automate operations.
Enhanced Inventory Accuracy	Using the power of RFID to automate operations and to produce enhanced inventory accuracy with a range of strategic benefits.

CURRENT STATE

Current State is analysed using capital investment (averaged) and ongoing costs defined on the page above, and estimated cost savings, based on the RFID-enabled Functions defined on page 11 (with the exception of the read product details function which adds functionality, rather than reducing costs), on the following basis (labour costed at 45/hour):

	Current hours	RFID Hours	Saved Hours	Annual Occurrences	Savings
Stocktake	16	1	15	2	1,350
Find product	0.5	0.1	0.4	52	936
Scans	6	4	4	12	2,160

Using an IRR of 5% and an annual inflation rate of 2% gives the following NPV:

	y0	*y1*	*y2*	*y3*	*y4*	*y5*
Capitial Investment	-20,000					
Ongoing Cost		-1,600	-1,632	-1,665	-1,698	-1,732
Annual Savings						
Stocktake		1,350	1,377	1,405	1,433	1,461
Find Function		936	955	974	993	1,013
Specific Scans		2,160	2,203	2,247	2,292	2,338
Total	**-20,000**	**2,846**	**2,903**	**2,961**	**3,020**	**3,081**
NPV @ 5%	**-6,857**					

As apparent in the figures above, the simple automation of the current state involves significant costs without significant savings and makes any investment decision harder to sustain.

ENHANCED INVENTORY ACCURACY

This case assumes that Harfords would take advantage of the power of RFID to perform monthly stocktakes to generate a series of strategic business benefits are described in the Executive Summary. The cost savings are commensurably larger when compared to achieving the same performance with manual stocktakes:

	y0	*y1*	*y2*	*y3*	*y4*	*y5*
Capitial Investment	-20,000					
Ongoing Cost		-1,600	-1,632	-1,665	-1,698	-1,732
Annual Savings						
Stocktake		8,100	8,262	8,427	8,596	8,768
Find Function		936	955	974	993	1,013
Specific Scans		2,160	2,203	2,247	2,292	2,338
Total	**-20,000**	**9,596**	**9,788**	**9,984**	**10,183**	**10,387**
NPV @ 5%	**22,055**					

In this case, cost savings alone produce a compelling case if enhanced inventory performance is a strategic goal for Harfords.

PROJECT PLANNING

A broad project timeframe is presented below. It is recognized that the best time for a go-live will be at less busy times and before new season stock arrives. These target time frames are Jan/Feb and Aug/Sep.

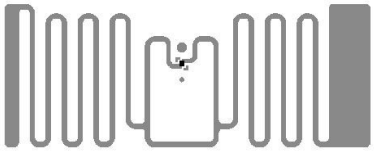
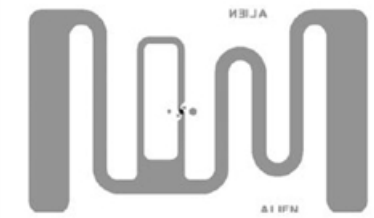
Phase	Explanation	Elapsed Time
Commercials and Specification	Confirm software, hardware and RFID suppliers and their relationships while completing a specification of the solution for Harfords to signoff.	1-2 months
Build	At Kudos, build the software and integrate with RFID equipment. Test onsite and potentially test at Harfords if deemed necessary.	2-4 months
Store Testing	Install equipment and ensure acceptable performance.	1 week
Phased Go-live	In phases, retag existing stock and tag all new stock while utilizing the new functions for tagged stocks. The speed is dependent on the ease of retagging and the capacity of Harfords.	1-6 months

APPENDIX 1 - TECHNICAL DETAILS

This section provides additional technical details on tag encoding methods, alternatives to a handheld system and additional details on software systems.

TAG DETAILS

Two tags are identified as contenders for implementation:

	ALN-9720 HiScan EPC Class 1 GEN 2 inlay tag Dimensions 44 x 19 mm (white/wet) Suitable for hang (swing) tags Higgs 4 chipset 128 bit EPC memory 64 bit TID memory 128 bit user memory	• Preferred option. • Fits neatly in place of existing label. • Narrower. Possible issue getting all Harfords information on. • Specifically designed for handheld readers. • Manufacturers roll size 25,000
	ALN-9728 GT EPC Class 1 Gen 2 inlay tag Dimensions 54 x 34 mm (white/wet) Suitable for hang (swing) tags Higgs 4 chipset 128 bit EPC memory 64 bit TID memory 128 bit user memory	• Larger • May obscure other labels on swing tag unless carefully placed. • Manufacturers roll size 15,000

Some explanatory notes:

1) EPC Class 1 GEN2 means that the tag uses an internationally standardized RFID protocol.
2) The Higgs 4 chipset is a known high performing RFID chipset used as the microchip in the centre of the tag.
3) EPC stands for Electronic Product Code, this is the information about the tag that will be encoded by the printer to identify the item that is tagged.
4) TID stands for Tag ID this is the tags own unique identifier which can be used to discriminate one tag from another.
5) User memory is non prescribed memory available to software developers to encode additional information onto the tag as desired. Reading user memory generally slows down the inventory process when stocktaking and should be used judiciously.

HiScan Tag

Current Label

GT Tag

The preferred (HiScan) tag is the correct width but at approx. 40 x20 mm is 10 mm shorter than the current label. This means that redesign of the current layout will be required to fit the required information on the label. This may include for example:

- Moving and combining the human readable PLU and manufacturer ID possibly to the top left corner
- Moving the pricing information to the top right corner
- Truncating the barcode
- Modifying the product description

If this cannot be readily achieved then the GT tag could be used as an alternative. If this the GT tag proves to be too large then further work will be required to shortlist alternatives.

TAG ENCODING

The information encoded on the tag will generally reflect the information printed on the label and should be designed to enable some functions without need for a real time connection to the stock database.

Each tag has a memory space called the EPC which is used to carry the unique identity of the item (garment or such like). The EPC is binary encoded by an RFID reader/writer. In the case of Harfords, an RFID enabled printer that incorporates an RFID reader/writer engine will be employed to encode the tags.

The EPC is encoded with a 96 bit value (24 characters). The following is proposed:

Field	Name	Purpose	KUDOS Database Field
1	Store or Branch identifier	Identifiers label as a Harfords tag optional enumerates store location	Y
2	SKU	Stock keeping unit or PLU identifiers item in stock keeping database, derived from KUDOS system	Y
3	Season	Identified the approximate age of item	Y
4	Group	(Optional) for searching a range of PLUs	(needs enumerating)
5	SerialNo	Serial number of item (see notes on serialization)	N
6	Application Format Identifier	A format indicator (AFI) may be required to identify the tag encoding format if the format evolves to include other fields over time.	N

STORE IDENTIFIER

The Store identifiers describe the organizational entity that holds the stock item. This field could be used to quickly exclude items (tags) that do not form part of Harfords inventory as RFID tags tend to proliferate in public.

The field could be used for aftermarket purposes to identify the store where the item was purchased (if and only if the tag is retained by the customer when the item is purchased).

The store identifier also can be used to qualify the Stock keeping unit as belonging to Harfords to prevent misinterpretation of the SKU field.

Store identifiers are supported in the current software system.

SKU

The Stock keeping Unit (SKU) is in Harfords case, synonymous with the price look up or PLU though it could have a wider context for any item whether it is for sale or not. Currently the stock keeping database assigns a 6 digit number which could be encoded.

SEASON

Aging stock could quickly be identified by an RFID reader checking the Season field. Enumerating the season (e.g. Winter 2015, Summer 2016 etc.) will enable Harfords to identify stock to be marked for discount.

Season are supported in the current software system.

GROUP

The Group field associates multiple PLUs to a single Group number, for example a suit jacket and suit trousers that could be sold as separates for the purpose of cycle counting items with (in this example) the view to identifying jackets that to not have corresponding trousers. It was considered that this field may not be necessary if cycle counts simply count every tag and then in a post processing function in software filter out all PLUs that are not under consideration. This field is proposed as optional until its necessity is confirmed.

Groups are currently supported in the software system but not explicitly enumerated for encoding on a tag.

SERIAL NUMBER

The serial number of the item (e.g. garment) uniquely identifies the garment and allows stock counting equipment (RFID readers) to count uniquely encoded tags but in general the serial number is less important than the count of each type of item (SKU or PLU) for inventory control purposes. Though the serial number could be used to search and locate a specific item if required.

There are two strategies for creating a serial number. The first is to maintain a sequential non-recurring counter in the inventory software system that allocates a unique serial number whenever a label is printed.

An alternative method that is supported by many printers is to copy all or part of the tag's TID field into the serial number field of the EPC in what is called a self-serialization process. The TID is a factory encoded unique number stored in the tag which cannot be changed. Under a self-serialization scheme no additional software counter is required in the inventory software. This is the recommended method.

When stock taking counts are undertaken with a RFID reader only the EPC is read by the reader, the RFID inventory protocol is optimized to capture EPC values fastest. Additionally reading the TID or user memory slows down the inventory process and use more RF power (limiting read range) and is generally avoided unless specifically dealing with an individual item. This is why the TID is copied into the EPC during the serialization process.

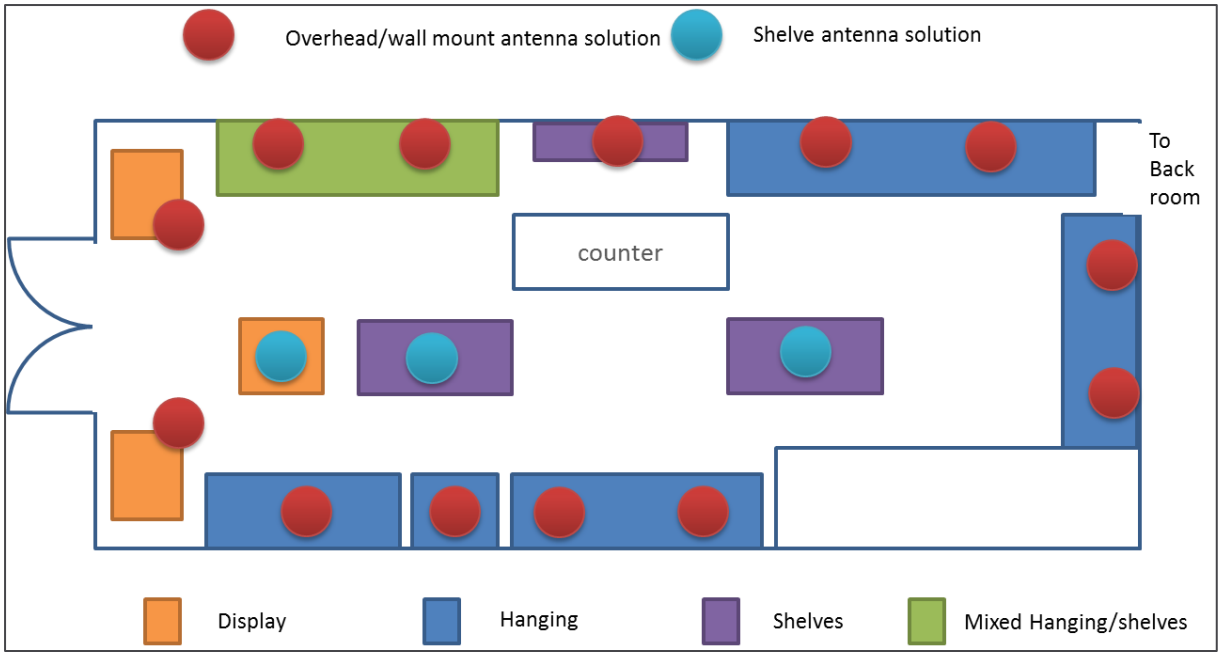
APPLICATION FORMAT INDICATOR

Format indicators (AFI) are often used in tag encoding schemes to identify the specific version of field types and sizes. An AFI is incorporated if it envisaged that other field types will be added to the tag in future. For example a future format of the label may include a “sold” field (equivalent to a sold sticker) to show that the goods have been purchased and should not be included in a blind inventory count or not set off an EAS alarm.

INFRASTRUCTURE BASED SOLUTIONS

Automating data capture in the store would require a front end engineering process to accurately size the number of readers and antennas and obtain acceptable level of coverage to deliver high inventory accuracy (say greater than 97%). However initial estimations based the current store layout are made here. Two forms of RFID infrastructure were considered: a) traditional wall and ceiling mount planar antennas which give a beam-width of about 120 degrees from the front of the antenna and b) zone based antenna systems, ceiling mounted which "sweep" the zone in a full circle continuously. For both approaches a separate solution is required to handle the lower most shelves of the shelving units, likely to use mat or planar antennas mounted on the floor or under the lower shelves.

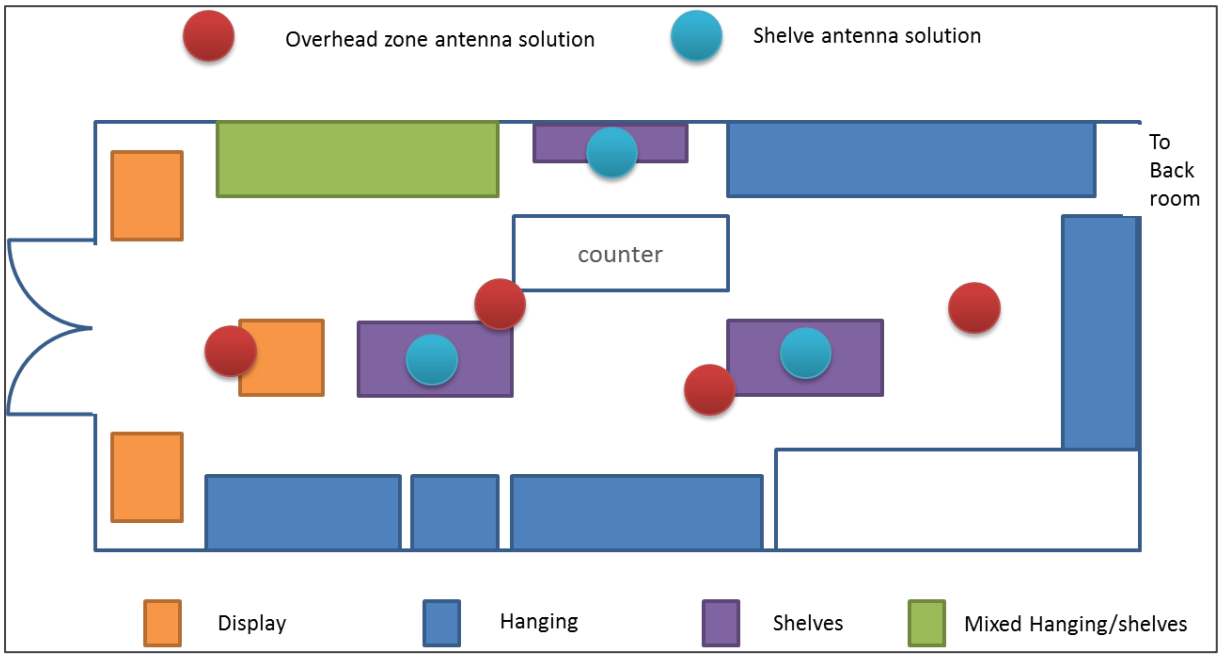
Wall and ceiling mounted antenna would require a significant number of antennas to cover the store, risking the aesthetic look of the store unless clever use of conduit or ceiling mounts are used to disguise cabling.



Store Planogram – Traditional Fixed Infrastructure

Item	Description	Quantity	Cost Range
1	RFID Printer	1	$2500-5000
2	Traditional Infrastructure Systems (up to 4 antennas per reader) Including readers, antennas, cables (approx. 16 antennas needed)	3-4	$3000-4000 per system ($9,000-16,000)
3	Handheld computer, RFID enabled for exception handling processes	1	$2500-4500
4	Desktop Reader (optional)	1	$700-1000

A zone based system would drastically reduce the number of antennas and would be predominantly mounted in the ceiling cavities with an antenna dome visible. Shelving readers would still be required to handle lower shelves.



Store planogram – Zone based Infrastructure

Item	Description	Quantity	Cost Range
1	RFID Printer	1	$2500-5000
2	Zone based Infrastructure Systems Including single integrated reader and antennas, cables	3-4	$5500-6500 per system ($16,500-26,000)
3	Traditional Infrastructure Systems for shelving unit (approx. 3-4 antennas needed)	1-2	$3000-4000 per system ($3000-8000)
4	Handheld computer, RFID enabled for exception handling processes	1	$2500-4500
5	Desktop Reader (optional)	1	$700-1000

Additional costs would be incurred for:

- Front end engineering.
- Installation.
- Power and data reticulation.
- Fixture and fittings.
- Maintenance and service level agreements.

EQUIPMENT SELECTION

Based on the applications deemed suitable for implementation, infrastructure solutions do not appear to be warranted on the basis of cost or benefit (refer to applications that were rejected). Infrastructure based systems are worth further consideration if the scale of operations increases markedly. They may be of interest to suppliers to Harfords. Infrastructure systems are also better suited to operations where real time dashboards are desirable.

Desktop readers for use at the point of sale may require special counter antenna design and handling processes for tags at the checkout, therefore in the first assessment a desktop reader could be avoided by

retaining traditional bar code processes could be retained (which staff already understand) and a processes could be introduced for collecting tags (labels) so that they can be properly disposed. A disposal process is needed to avoid tags from being inadvertently re-scanned as live inventory. Alternatively a handheld reader could be used to decommission tags away from the checkout counter.

Hardware for the proposed implementation of a hand-portable solution is available from a number of vendors, however given the vendor relationships that Kudos already enjoy, devices have been chosen from the Zebra (formerly Motorola) catalogue. This has the added benefit that break/fix and service level arrangements can be readily incorporated using Kudos as a single point of contact.

Device	Description
	MC55 handheld computer. ❖ Commercially rated for retail operations ❖ Numeric keypad ❖ Wifi enabled ❖ Windows Mobile 6.5 ❖ Used in conjunction with RFID sled. ❖ 1D and 2D barcode imaging
	RFD5500 UHF RFID Sled ❖ Pistol grip, point and shoot ❖ Docks with range of handhelds ❖ Lightweight, small form factor
	RFD8500 integrated RFID and imager ❖ Barcode and UHF RFID ❖ ZETI easy text interface for rapid integration ❖ Multi- OS support ❖ Bluetooth or batch mode synchronization ❖ Not Available in NZ until late 2015 ❖ Pricing not yet available
	MC3190Z integrated handheld computer and RFID ❖ Barcode and UHF RFID ❖ Full alphanumeric keypad but with separate large numeric ❖ Windows mobile 6.5 ❖ WiFi enabled ❖ One piece, robust device
	Docking Cradle ❖ Required accessory for battery charging ❖ Data transfer via LAN or USB ❖ Extra battery charging bay.
	Zebra ZD500R RFID Printer ❖ UHF RFID ❖ 203 DPI ❖ Thermal transfer or Direct Thermal depending on label choice ❖ USB and LAN (Ethernet) interfaces ❖ EZPL ❖ Tear Bar

Device	Description
	Thingmagic Desktop USB reader (optional) ❖ UHF short range (0.25W) ❖ Powered over USB interface ❖ Programmable indicators

EQUIPMENT SELECTION CONSIDERATIONS

RFID enabled handheld computers are proposed in preference to a basic RFID scanner because the former includes a display and keyboard enabling more sophisticated functionality with user input compared to a basic scanner which would only be able to count and record tags.

The Zebra portfolio includes RFID devices that run on the Windows Mobile (6.x) operating system (aka WinCE). This operating system still has considerable use in industry but is aging from a software support perspective. However some devices also run on the android system. Final device selection should consider the software development capabilities of the software provider (Kudos) and also consider that newer devices, albeit currently higher priced, may be preferable when outsourcing software development to find readily available skills.

Large full keyboard layouts make devices bulkier or result in very small keys that are not quick and easy to use. Preference is given to devices with a large numeric keypad (with alpha keys available as a secondary function. Applications can be designed to accept mostly numeric input, pick list or use the touch screen if required.

Preference is given to devices that have 1D or 2D barcode readers built in as well so that bar codes can be used if RFID tags are not readable.

Sled arrangements allow flexibility to use different handheld models as well as use the handheld separately for barcode only operations. The resulting two piece solution may be less appealing from an asset management perspective than a single device.

Wi-Fi capability in handheld readers will also allow direct transmission of readings to a database as an evolutionary advancement over docking the device in a cradle and executing a data synchronization process.

Consideration should be given to continuity of operations in the event that equipment is broken or temporarily out of service.

New devices coming to market such as the RFD8500 will enable support for other operating systems (e.g. android, iOS) and with text based data transfer may present and alternative especially for web based applications, reducing the requirement for client application software to be developed and deployed to the handheld computer. Pricing is not yet available.

SOFTWARE REQUIREMENTS DETAILS

LABELLING SOFTWARE

The current process for receipting goods and generating pricing labels should be retained with the following modifications:

1. The label information will be reformatted to suit the dimensions of the proposed label, Label design is integrated into the current system.
2. A non-printing field is required which represents the encoded tag value. This field is calculated and consolidated from enumerated database fields. The field will visible on the screen but need not be printed in human readable form on the label.
3. A driver is required to operate the RFID engine in the printer
4. The printer process for self-serializing the tag should be followed; this will involve reading and writing to the tag as well as verifying the encoded value.

HANDHELD STOCKTAKING PROCESS.

Application software is required for the handheld computer to undertake various stocktaking operations including:

a) Blind stock take of every item
b) Cycle counting of different product types e.g. shoes, ties.

Blind Stocktaking will involve reading every tag in the store in a systematic way and generating a list which can be used to update inventory levels.

The stock list could be filtered by the inventory software to produce reports against product type or age and identify variance against expected levels and in turn reconciled against POS records. This is a post processing procedure after the stocktake or cycle count is undertaken.

Alternatively a list could be pre-loaded on the handheld containing one or more PLUs along with expected stock levels and the handheld will indicate the variance for each PLU or as a total as items are read.

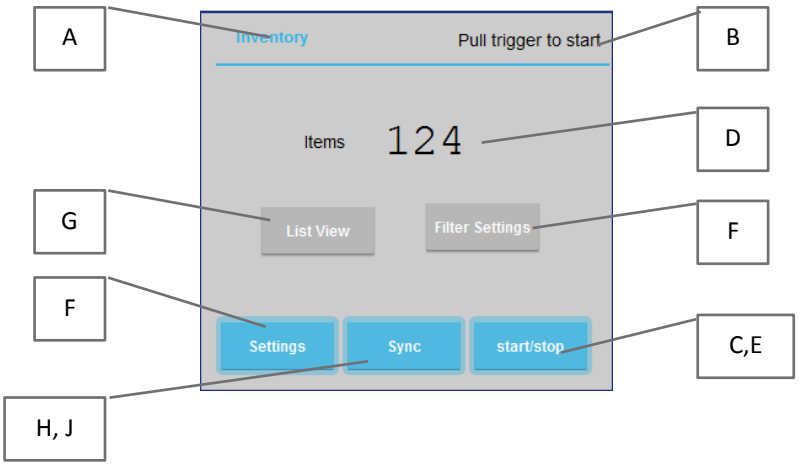
Key functional requirements include:

1. Counts and records unique tag values
2. Filters the count and records a subtotal based on filter criteria
3. Integrates with RFID reader engine
4. Supports file based data upload or synchronization with inventory system either automatic or under user control
5. Optionally supports wireless data transfer to in real time or batch mode to software inventory system
6. Displays pertinent information to user
7. Allows data entry by user for configuration and control

The following functionality is proposed for the application and graphical interface:

1. A label indicating the application function (A)
2. A status Indicator (B)
3. A button to precondition (start or stop) the inventory process (enabling or disabling a trigger press on the RFID pistol grip). (C)

4. A field indicating the number of unique tags read. (D)
5. A means of resetting the count (E)
6. A settings menu or button option (F) including (but not limited to):
    a. Configuration settings for data synchronization (wireless or docked)
    b. Filter settings e.g. on PLU, group or season, if enabled
    c. RFID power level settings
    d. File storage locations and naming
    e. Sorting and data group and view options
7. A view option to list the full tag value as it is reads and/or grouped and subtotalled by PLU or other sort and group arrangement. Alternatively a view of variance. (G)
8. A button or means of synchronizing or uploading data to the inventory system (possibly in addition to automatic or prompted methods) (H)
9. A means of loading data sets from the inventory system for reconciliation (J)



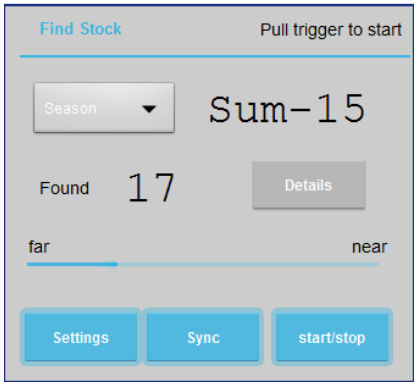
HANDHELD ITEM SEARCH PROCESS

Finding stock items requires putting the reader into a “Geiger counter” mode wherein the frequency of reads is measured and displayed in a way that informs the user that the product being sought is nearby.

A handheld application would items similar to the stocktaking application with the addition of:

- A means of selecting the fields or attributes of the search or downloading them from the database.
- A means of sending the results to the database if required, in the case where there are multiple search results to be captured.
- A means of indicating visually and audibly when there is a match to the search in the beam of the antenna,
- A means of showing when the number of matches increases or decreases as one moves the reader.
- A means of showing product details (from the tag and possibly from the database) of an item that matches the search criteria.

A concept drawing is provided below based on the example of searching for items from the summer of 2015 season:


Find Stock
Pull trigger to start
Season
Sum-15
Found
17
Details
far
near
Settings
Sync
start/stop