

\$2,814M Increase in annual Wal-Mart net profit with RespectRFID System

Assumptions of this paper analysis:

Jan-06

Tags are applied by stores. 20 cents for tag + 7 cents to apply

Installation of RespectRFID Systems in all stores in one year (for clarity). **\$245,000M** = Wal-Mart 2003 sales

Use of RespectRFID System results in both obvious and non-obvious benefits to increase income and reduce costs

Obvious Benefits

Income increased

Customers consistently find items in stock: automatic low-stock actions + some replenish from near-by stores

Customers informed when item wanted is back on the shelf, or if the price had been reduced or will be raised

Shopping pleasure - no annoying alarms at doors

Shopping pleasure - more accurate and faster checkout

Customers can confirm stock availability before selecting which store to patronize

Web purchases quickly picked up at local store or shipping locally

	6%	Increase in gross profit resulting from a \$1 increase in sales (Wal-Mart 2003)
x	<u>7%</u>	Increase in sales due to use of RespectRFID System
\$1,029M	0.42%	Increase in gross profit X increase in sales

Labor costs reduced

Reduce manual inventory checking

Reduce re-shelving labor (misplaced, abandoned by customer, return of goods)

Reduce need to unlock items protected from theft (increased availability will increase impulse sales)

	7%	Cost of labor as a % of sales in Wal-Mart in 2003 (10% = typical for Retail)
x	<u>5%</u>	Reduction in labor costs due to use of RespectRFID System
\$858M	0.35%	Increase in gross profit X reduced labor costs

Losses reduced from shoplifting, boosting, employee theft, employee fraud

	0.66%	Loss as a % of sales (Wal-Mart 2003)
x	<u>90%</u>	Reduction in losses due to use of RespectRFID System
\$1,464M	0.60%	Increase in gross profit due to reduction in losses

\$3,351M Gross Profit from obvious benefits

Non-obvious benefits

Cyber clerks talk to customers & clerks via custom cellphones (which have in-store location awareness)

Each cyber clerk will be able to help people anywhere around the globe.

The cyber clerk's computer display will show the customer and a map of the store showing his location

The cyber clerk's computer display will also have detailed inventory & product knowledge - in many languages

Income increases by providing customer assistance

Provide help locating item - cellphone can be a 'Geiger counter', or computer can provide right/left direction suggestions

Provide help for customers who can not speak the local language: find items, checkout, etc.

Note: 47 million Americans do not speak English at home. How many feel uncomfortable in English-only stores?

Provide detailed product knowledge by reading package information, product instructions, and associates comments

a subset of product knowledge could be pre-recorded in many languages and provided at much lower cost

Provide after-sales product assistance for some expensive products (currently provided in Wal-Mart in Japan)

Provide help for disabled customers: wheelchair, blind, stutter, dyslexic, deaf,...

Provide help for gift and wish lists - direct customer to items which are in the store

Provide announcement when item/service is ready: tires, glasses, photos, barber, pharmacy.. Customer shops while waiting

	6%	Increase in gross profit resulting for a \$1 increase in sales (Wal-Mart 2003)
x	5%	Increase in sales due to use of inventory/product knowledge as listed above
\$735M	0.30%	Increase in gross profit due to increase in sales

Labor costs reduced

Associates will be more productive when they have instant access to information - via cellphone

Location(s) of an item, inventory available in back room/nearby store, when the item is expected.

	7%	Cost of labor as a % of sales in Wal-Mart in 2003 (10% = typical for Retail)
x	5%	Reduction in labor costs due to knowledge sharing with RespectRFID System
\$858M	0.35%	Increase in gross profit due to reduced labor costs

Training and hiring costs reduced

	\$1,500M	Current cost of hiring and training Wal-Mart associates
	15%	% cost reduction due to reduced training time
	15%	% cost reduction due to reduced turnover due to knowledge sharing
\$450M	30%	

\$2,043M Gross Profits from non-obvious benefits

\$5,393M Total Gross Profit: obvious + non-obvious

\$2,814M = Increase in annual net profit after first year - without adding a single store							
	Net = Profit	Gross Profit	- Cost Total	Cost details			
				install ¹	upgrade ²	annual ³	develop ⁴
year 1	\$38M	\$5,393M	\$5,355M	\$3,017M	\$0M	\$2,255M	\$84M
year 2	\$2,814M	\$5,393M	\$2,579M	\$0M	\$441M	\$2,054M	\$84M
year 3	\$2,814M	\$5,393M	\$2,579M	\$0M	\$441M	\$2,054M	\$84M
year 4	\$2,814M	\$5,393M	\$2,579M	\$0M	\$441M	\$2,054M	\$84M
year 5	\$2,814M	\$5,393M	\$2,579M	\$0M	\$441M	\$2,054M	\$84M

Note: **11.9 months** = time to payoff the investment

1) Costs: install

20 Sq. miles of retail space / 5,000 Stores @ 110,000 Square foot/store
 100 Aisle length - estimated X 12 Distance between centers of aisles in feet- estimated
 1,200 Square feet covered by 2 nodes (each node has 1 RFID transceiver, 2 fixed video cameras, and 1 cellphone system)
 600 Square foot per node, or 183 Nodes per store = square foot per store / square foot per node

\$238,333 Cost of nodes per store = \$1,300 Cost per installed node X nodes per store

\$300,000 Cost of computer, wireless displays, per store

\$538,333 Cost of all hardware per store

\$2,692M Hardware for all stores = hardware per store X number of stores

\$250M Training: 1 day for 1,000,000 associates

\$2,942M Costs: hardware + training

\$75M Cost of phones= \$150 each 100 phones per store X 5,000 stores

\$3,017M Total costs: hardware + training + phones

2) Costs: upgrade maintenance and training

\$441M Annual maint & upgrade = 15% of installation - includes on-going training

3) Costs: annual

7,424,242,424 tags = store sales / \$33

A better estimate of number of tags will require the number of items sold over \$20, and distribution of number of items under \$20

\$12 emp. \$/ hour = \$0.20 employee cost per min. 3 tags applied per min.

Cost to apply tag \$0.07 \$0.27 Cost of tag + installation

Tag all \$20+ items and all items prone to being stolen

Tag remaining items such that the the cost of tagging is less than 1% of item price: ..

tag 60% of items \$10-\$20, tag 30% of items \$7-\$10, etc.

Also tag those very low-cost items which are near bottom of stacks to serve as out-of-stock indicators

This tagging policy should create low-on-stock alarms for about 90% of all items in the store and 98% of total value in the store

\$2,005M First year cost of tagging at \$0.27 each, installed 10% less in all subsequent years

Annual cost of cyberclerks

\$250M Cost of cyberclerks = 5,000 cyberclerks \$50,000 cost per year

\$2,255M First year cost: tags, tagging, cyberclerks, **\$2,054M** subsequent years

4) Costs: develop and testing - amortized

\$70M Purchase global patent rights, prototype

\$150M Pilot test in store(s) - includes high-volume manufacturing of tags, nodes, etc. and initial system integration

\$200M Full development - completes the integration with Wal-Mart inventory system and adds cyberclerks

\$420M Total development and testing costs

\$84M Amortized over 5 years

Additional benefits of RespectRFID System - not factored into this analysis

Reduce cost of inventory held by each store - quickly move inventory between stores

Reduce cost of Loss Prevention: aware of value of items being shoplifted, so can concentrate on high value items

have video record to present at court - reducing time to be present at court

be alerted when an unpurchased item is brought into high risk areas: fitting room, rest room, break room

eliminate Electronic Article Surveillance (EAS) costs and problems with false alarms

Find lost child quickly without interrupting all associates- use video cameras and custom software

Reduce losses due to mark-downs - able to distribute end-of-season stock across stores

Increase sales by offering free shipping for items ordered which were not on the shelf

Business opportunity: license RespectRFID System to non-competitors, hospitals, libraries, DoD, FDA animal tracking, etc.

Business opportunity: discovery and recovery of property lost or stolen from homes, businesses, hospitals, etc.

police car can identify stolen tagged property (laptop, wallet, auto, etc.) while cruising the streets from a distance of 500'

Customer can get help quickly from a physical, not cyber associate - by using the store-provided cellphone

Increase sales of fad items by sharing information

Increase sales and improve customer loyalty by making it easy for customers to request new items