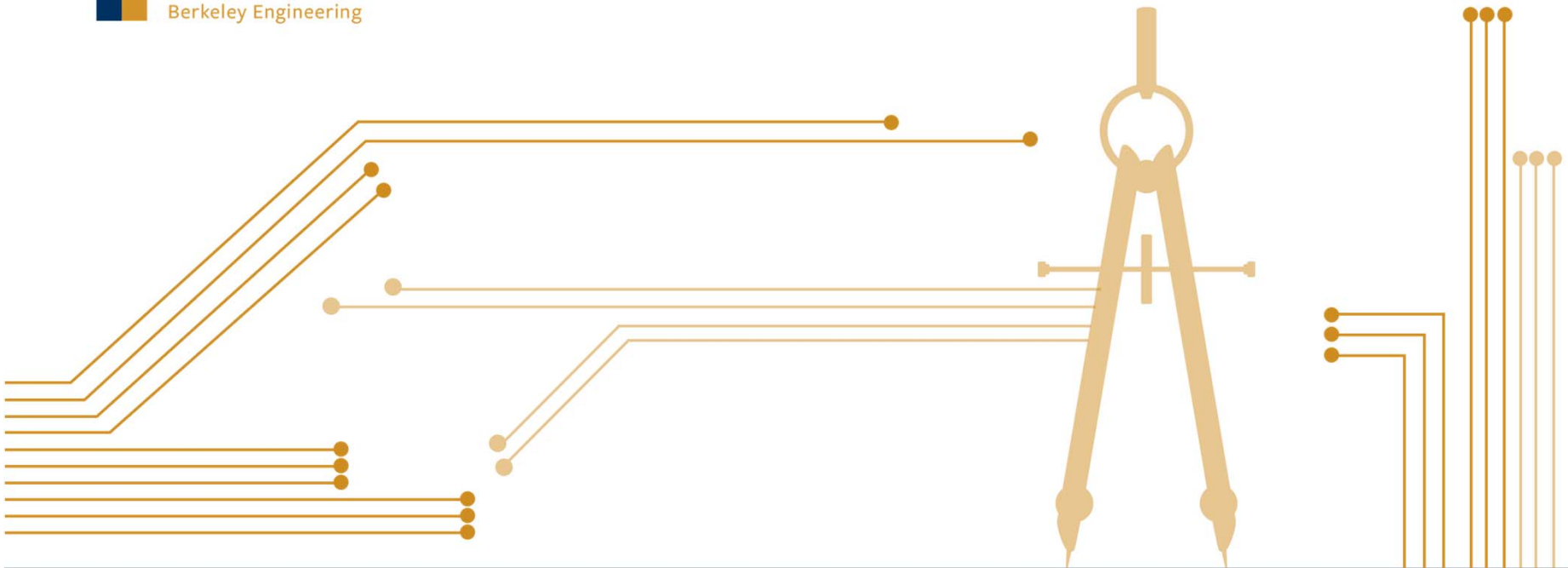




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# Future of self checkout

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## Current state of checkout



## Today... Retailers are losing customers and sales

33% left store  
without  
buying if lines  
longer than 7  
minutes

50% of  
shoppers  
avoid stores  
with long lines

66% look at  
online as an  
alternate for  
brick-and-  
mortar stores



Lower Sales



Poor customer  
satisfaction

**A Brand is more  
than a Logo.**

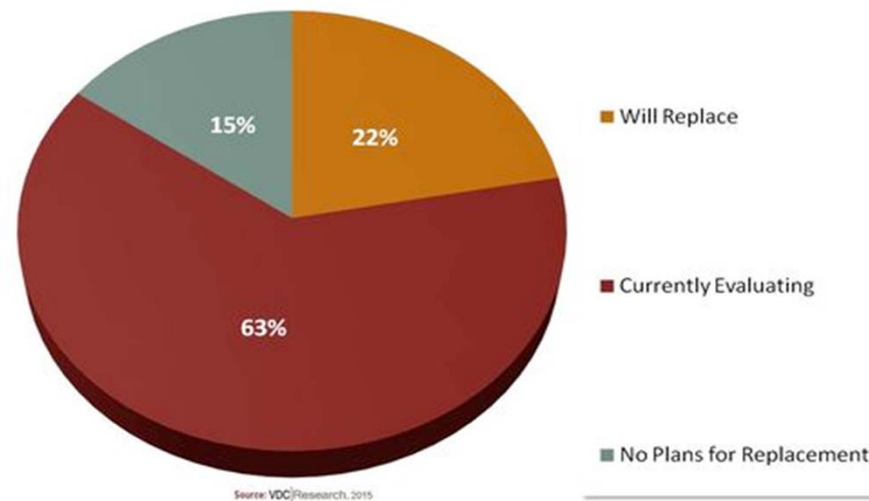
How **customer service** builds Brands!

Tarnished brand image

## How are Retailers responding today?

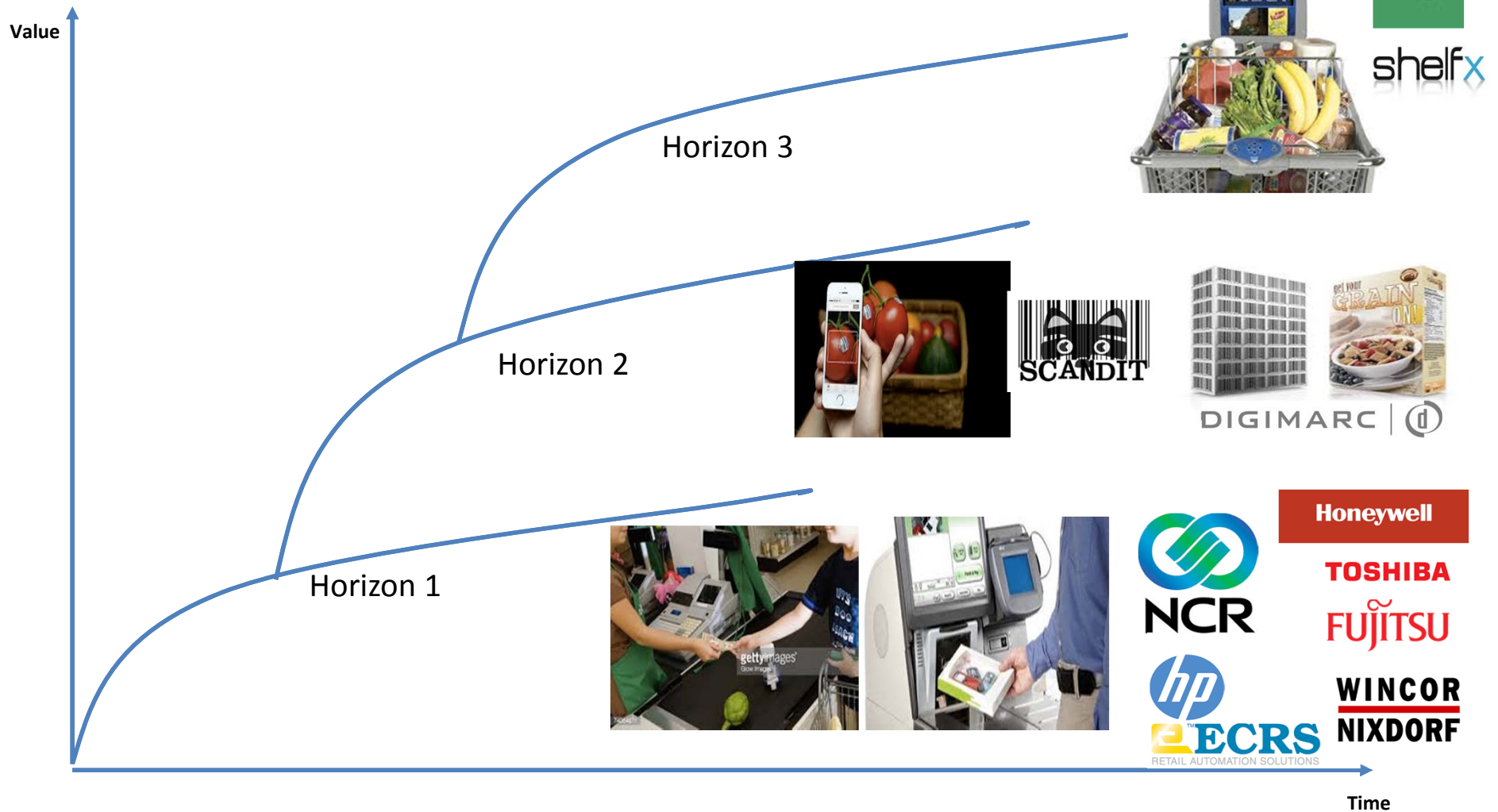
- Vast majority of retailers are considering upgrading their ID capture devices
- Transition from traditional purpose built scanners to Mobile based or personal shopping devices

Exhibit: Respondents' Plans to Replace Purpose-built Scanners with Mobile Scanning Devices



\*source: VDC survey

# Checkout landscape





## Case study 1: NCR - World's largest supplier of SCO technology

### Customers

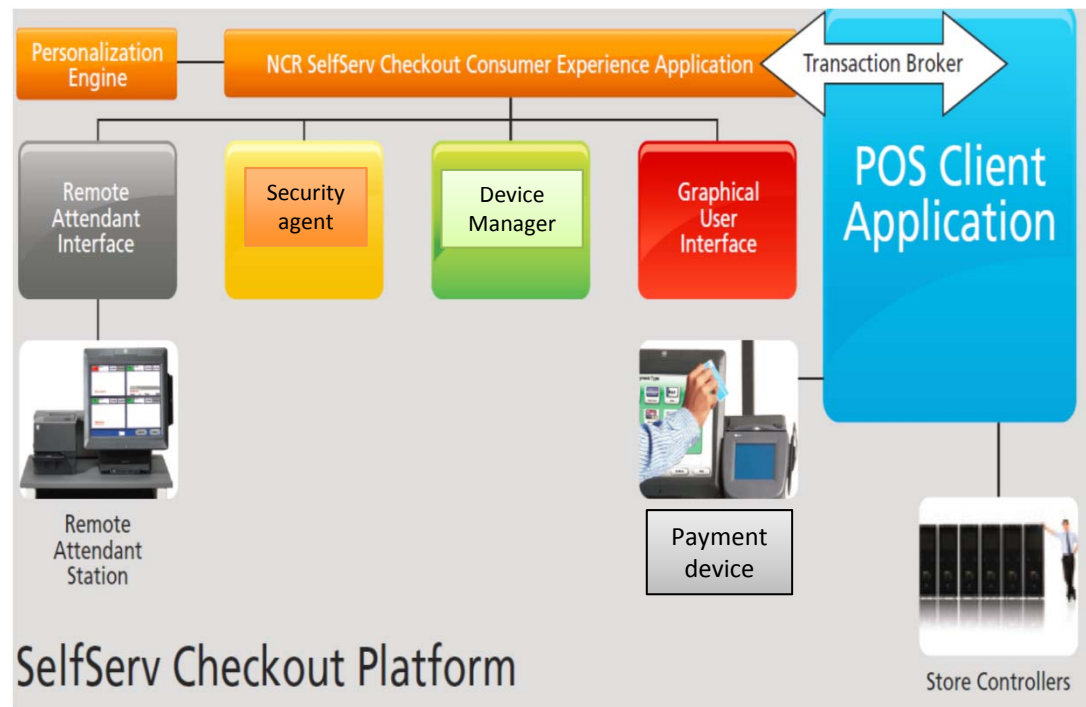
- 233 retailers
- Most Australian, European, US chains
- 100K+ SCO units deployed

### Technology

- Seamless POS integration
- Bi-optic scanner w/ LEDScan
- International EAS Tag deactivation
- wired/wireless scanner
- Security scale for weight verification
- Item integrity via self-learning weight database
- Remote attendant station
- High availability service.

### SCO Value proposition

Self-checkout ASP (4 units)	\$60,000
Headcount Reduction	4
SG&A Reduction @ \$30K each	\$120,000
Payback Period (months)	6



## Case study 2: Scandit - Mobile apps based SCO technology

### Customers

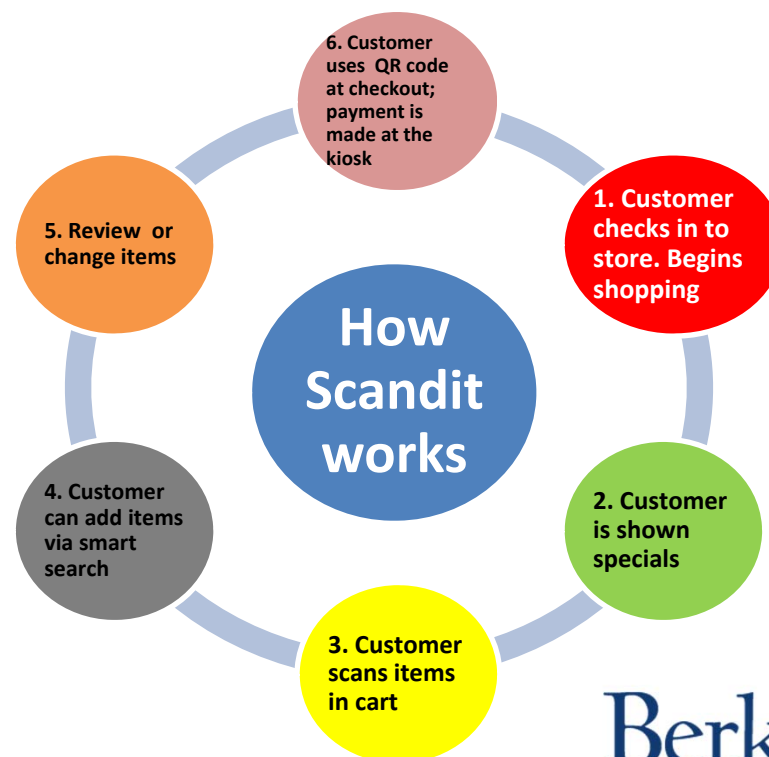
- Home depot, Capital One, Verizon, Genentech, Ahold

### Technology

- Scandit Mobile framework
- Scandit cloud services
  - Data caching
  - Barcode scanning (mobile and case)
  - User data management
  - Shopping list mgmt
  - Analytics
  - Notifications
  - Sharing
- Existing IT infrastructure
- QR code generator
- Kiosk to pay

### SCO Value proposition

Self-checkout SDK(500 units) :	\$4000
Payment KIOSK price 4@ \$2K	\$8,000
Headcount Reduction	4
SG&A Reduction @ \$30K each	\$120,000
Payback Period (Months)	1.2



## Case study 3: Digimarc – Watermark powered ID

### Customers

- Kraft Heinz Co, Wegmans, New Seasons grocers

### Technology

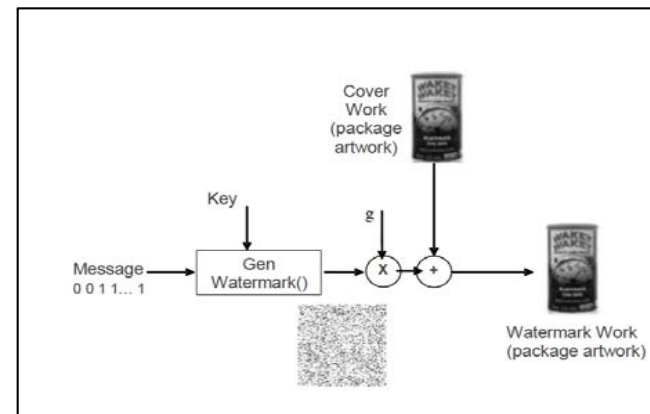
- Invisible watermark printed on all sides
- Readable by image scanners
- Robust against orientation
- Occupies zero package space
- Reuse existing package printing flow with one extra step – embed watermark
- Compatible with existing workflow on manned and SCO
- Biz model: IP licensing, SDKs

### Digimarc value proposition

Barcode cost (per SKU): \$300 initial + \$50/yr  
*For a supermarket chain with \$2.5B in sales, 40000 SKUs of which 10000 SKUs are of private label brand*

	Private label adoption	Complete adoption
Payback period	9months	3months
ROI 1 <sup>st</sup> yr	30%	400%
ROI 10yr	267%	1700%

### Watermark Embedder workflow





## Case study 4: Skip - RFID based SCO technology

### Customers

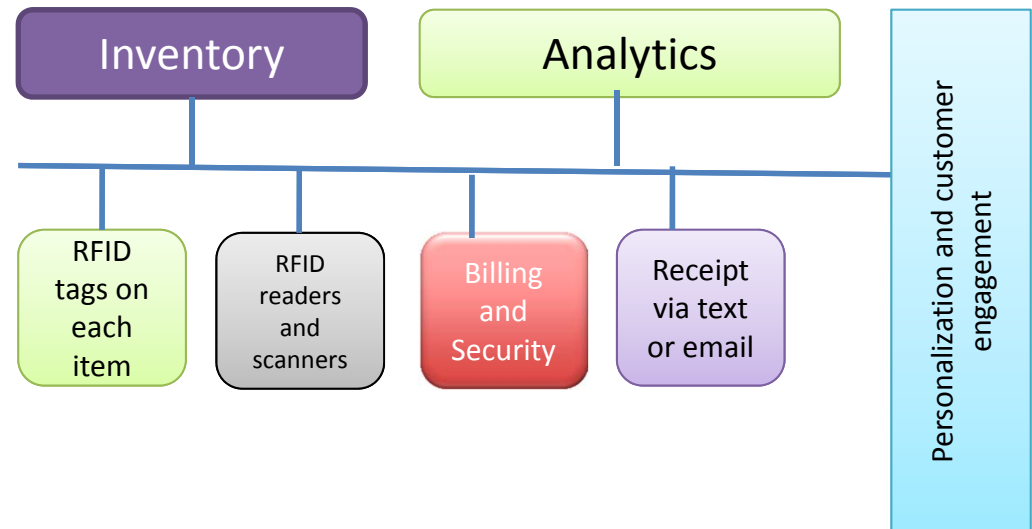
- ~30 early adaptors
- Macy's, American Apparel, Walmart

### Technology

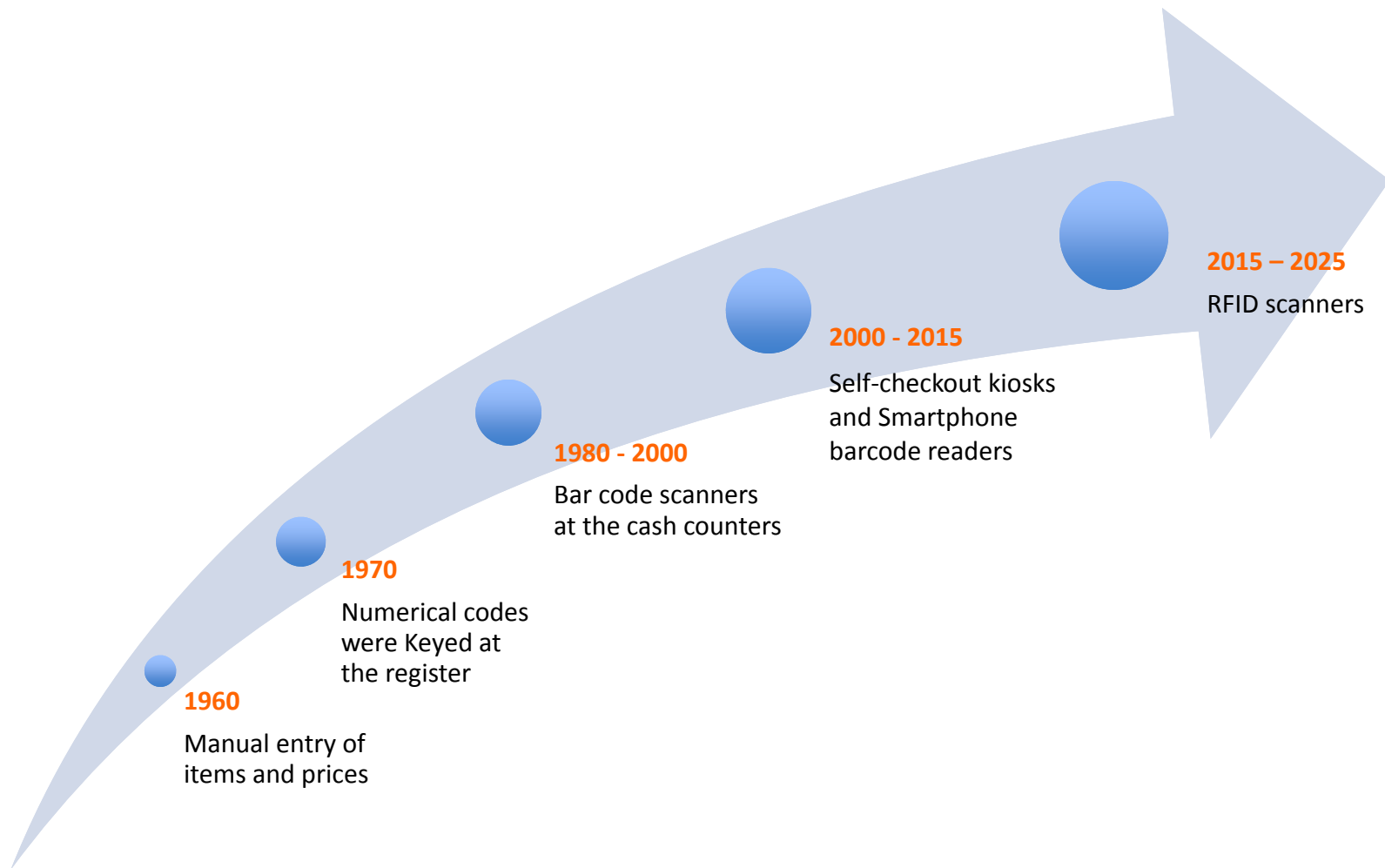
- Cost effective RFID tagging
- RFID readers detect/track the items
- Seamless integration with billing and security.
- Value added services – inventory management, and analytics
- Extensible platform for promos, ads and product details/recommendations.

### RFID value proposition

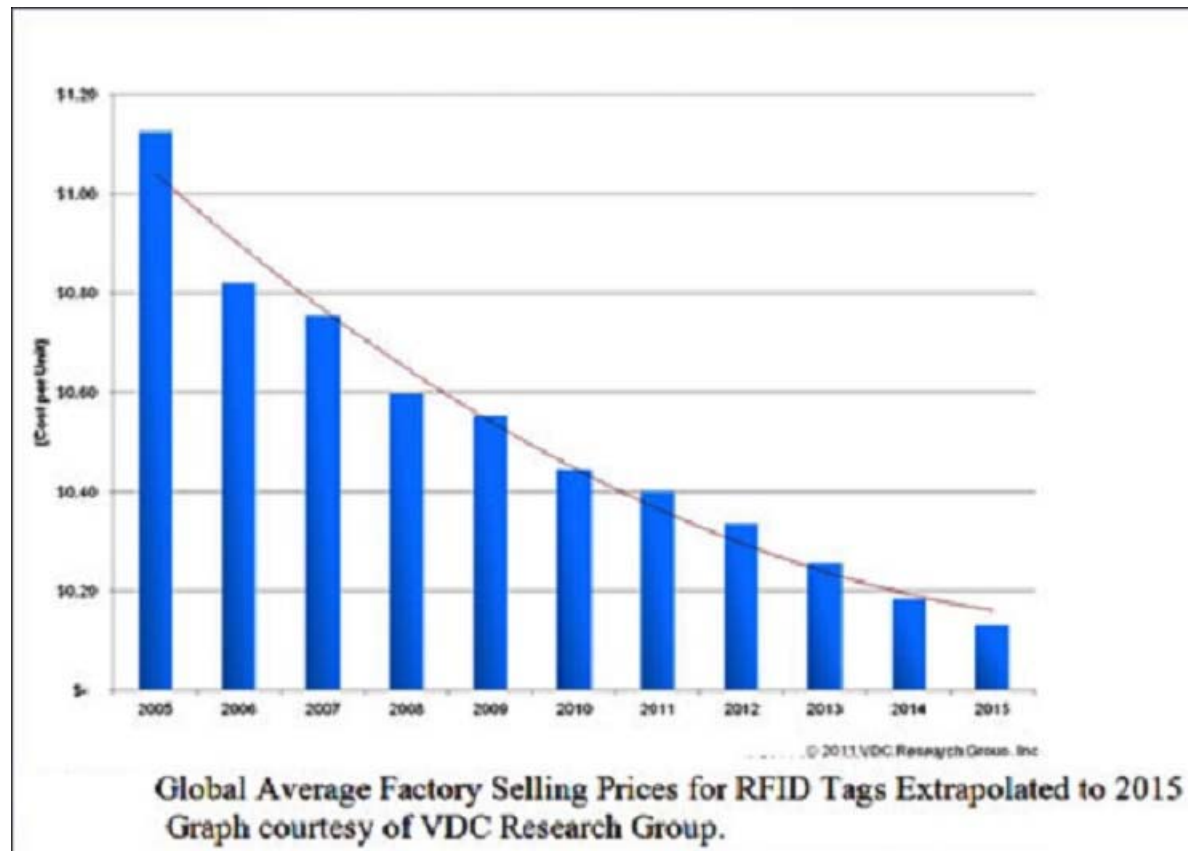
RFID tag costs:	~2c per tag
Industry grade RFID readers:	\$20,000
E2E solution:	\$100,000
Payback Period (months)	~12



# Technology evolution and trends



## Trend of Prices for RFID tags



# Technology details and challenges

## Smartphone based scanning

- App is used for scanning the items
- The aggregated list is checked out at the cashier or at self-checkout kiosk
- **Theft concerns** – No mechanism to ensure that all items are scanned
- **Customer annoyance** – not eager to do the job of a cashier

## Digital watermark barcode

- Entire item surface is used to superimpose the barcode
- Scanning is same as today except it is fast accurate and easy
- **Adoption** - All manufactures need to adopt to the new standard of generating the barcode
- **Cost** - Needs to an overhaul of the existing infra with new software

## RFID enabled scanners

- Each item will have a unique RFID tag
- RFID readers will detect the items as items are picked or passed through a scanner
- **Security** – no extra detection needed
- **Adoption** – All manufacturers need to align to have RFID
- **Cost** – generating tags and overhaul is quite expensive

# Regulatory and Societal Impact



## Regulatory Factors

- FDA Concerns on impact of **RFID radiations** on food products
- Environmental concerns on RFID tag **recycle and disposal**
- Privacy concerns on tracking customer behavior



## Societal Factors

- **Human interactions** and personal touch will be lost
- **Reduction** in hourly-pay jobs
- Only well-to-do customers with credit card and smart-phone will be benefited.
- Small and medium retailers will be at a disadvantage



## Conclusions



Company	Future	When	Remarks
<b>NCR</b>	Leadership position will be challenged by disruptive technology.	5 Years	Will need to innovate or acquire to maintain leadership and market share
<b>Toshiba</b>	May eventually abandon market	5-7 years	IBM self checkout acquisition did not pan out. No visible innovation agenda
<b>Scandit</b>	Acquisition target by NCR	3 years	Complements existing technology
<b>Digimarc</b>	Best suited to displace barcode technology in near term	2-4 years	Acquisition target by current market leaders
<b>Skip</b>	Potential major winner	5 years	Success dependent on RFID adoption. Funded by Microsoft