



# Barcode Scanner

Compact handheld product for small scale retailers

PRJ 127

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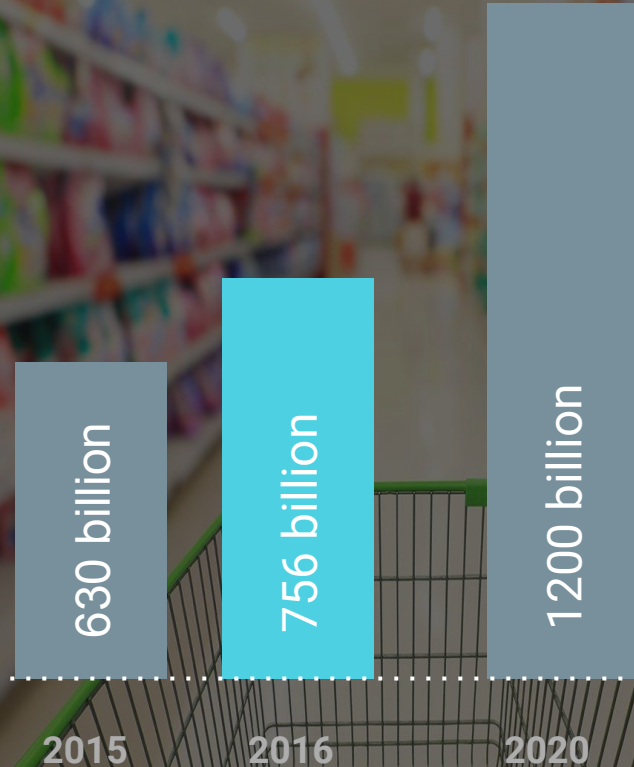
Srajan 2017

# Retail landscape in India

Out of the overall retail market in India which is estimated to be ~630 billion USD in 2015, 80-90% sector is unorganized which covers the small retailers and general stores.

Source : BCG Retail Report

Retail market in India (estimate in USD)



# Supermarkets vs General Stores







What makes supermarkets different than general stores?



# SUPERMARKETS

Digitally  
connected  
customers

More number  
of items per  
order

High  
customer  
convenience

Ordered  
inventory of  
goods





# RETAIL STORES

Manual handling of goods

Less number of items per order

Long waiting queues, Inconvenience

Unordered inventory of goods

# Sector performance shaping factors



This is where unorganized retail sector i.e. local retailers lag behind the organized retailers i.e. supermarkets in its sales performance.



A dimly lit small retail store, possibly a grocery or convenience store. In the foreground, a man in a light-colored sweater is seen from the side, looking down at a counter. To his left, another man in a striped sweater is partially visible. In the background, a person wearing a dark cap with a logo is standing behind the counter. The store is filled with various products on shelves and displays. A sign with the 'paytm' logo is visible on the counter area. The overall atmosphere is busy and focused on retail activity.

How can we make small retail stores  
equally competitive?





## THE CHECKOUT PROCESS

Manual handling of goods leads to long queues at store and lack of convenience to customer as well as shopkeeper which results in less retail sale.

# How we found a solution?

## AUTOMATION

### Step 1

Reduce the cost of scanning system to make the product feasible



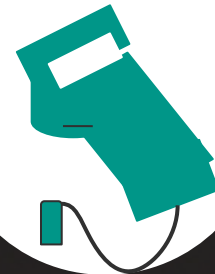
### Step 2

Make the interface user-friendly so as to eliminate the requirement of computer operator



### Step 3

Present the whole product as a compact device with micro-usb power supply.

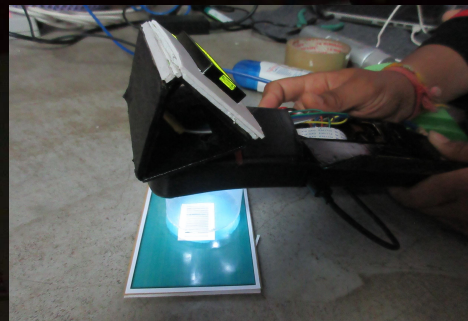




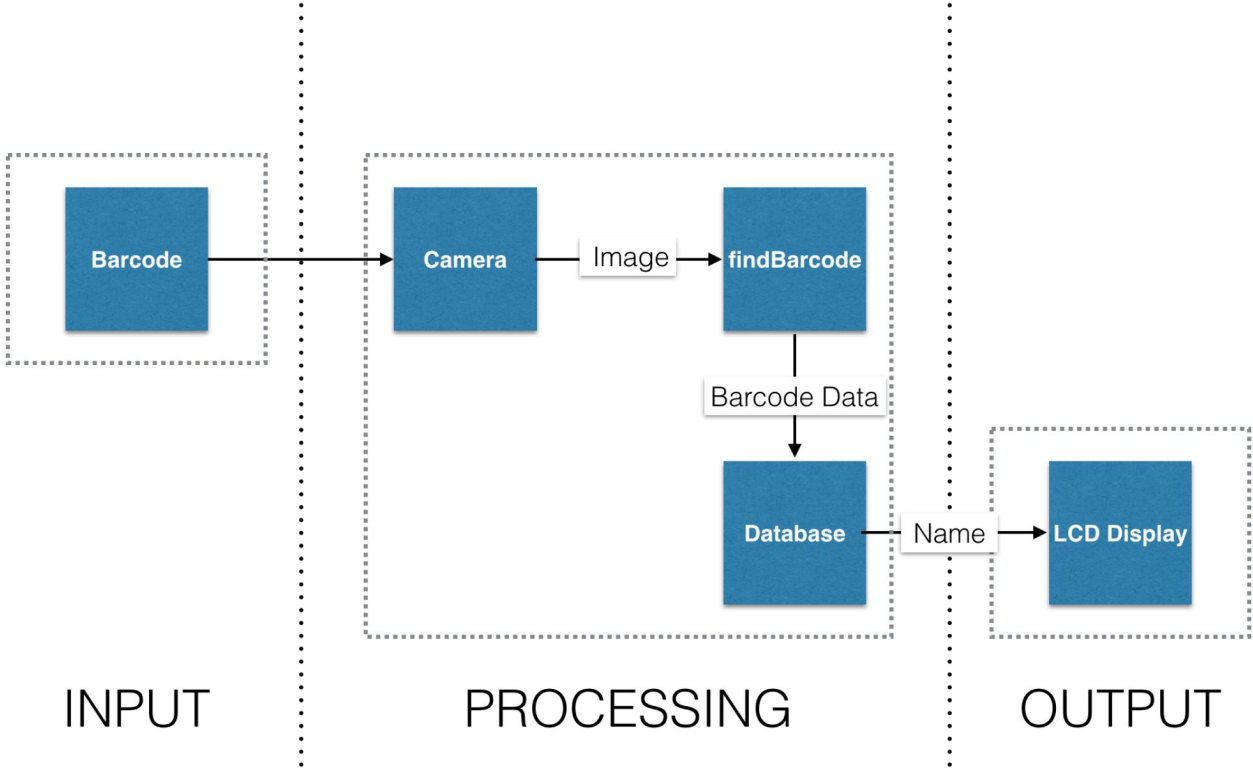
# OUR PRODUCT

## Barcode Scanner

A handheld device for small scale retailers

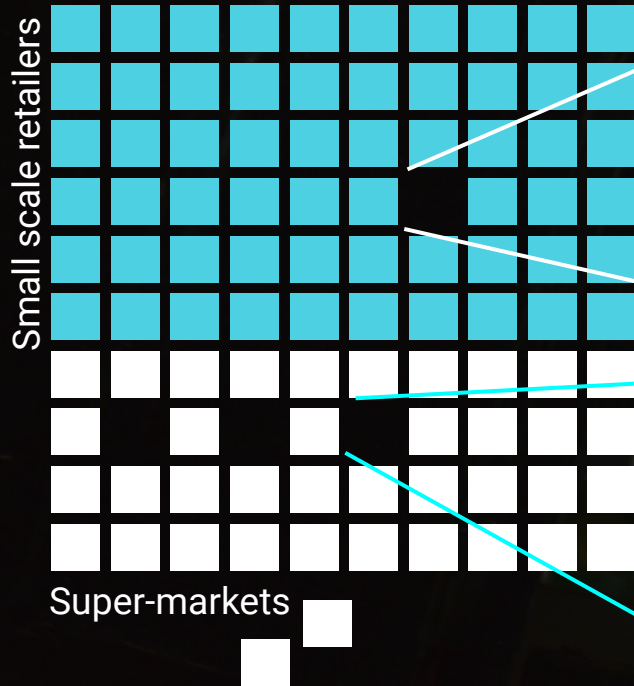


# LOGICAL STRUCTURE

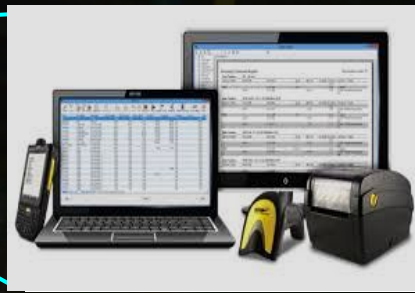




# Laser scanner vs Our Product



Scanner



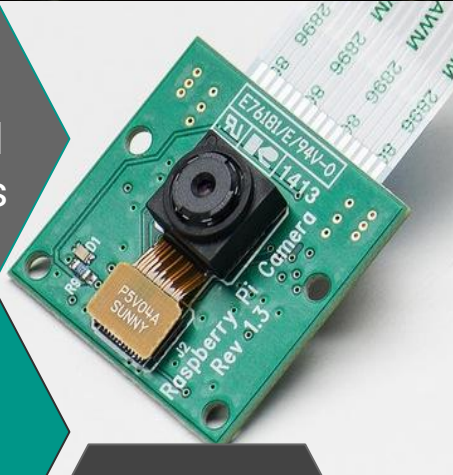
Scanner + Assistive computer system

# Scanning Module

Raspberry Camera : 5MP sensor

Laser Scanner

Can scan both 1D and 2D barcodes



Less expensive

Easy Interfacing with hardware

VS



Only scan 1D barcodes

More expensive

Complex Interfacing with hardware



# Processing Module

Raspberry Pi Board : 1 GHz ARM, 1 GB RAM

Computer system

Can be altered  
to perform  
functions as  
per need

Less  
expensive

Ease of  
operability  
because of  
Simple User  
Interface



VS



Operator  
should know  
how to use  
separate  
devices

More  
expensive

Skilled  
computer  
operator  
needed

# Power supply

Micro USB power supply

Raspberry Pi  
Board runs on  
5V, 2A

Less power  
usage  
(0.1 to 0.5 W)

Only one  
supply  
needed to be  
plugged in



VS



Separate  
power plugs  
for all the  
peripherals

More power  
usage  
(60 to 300 W)

# Overall installation cost

Rs. 5500

Rs. ~40,000

Raspberry Pi  
Board  
Rs. 3000

Raspberry Pi  
Camera  
Rs. 1500

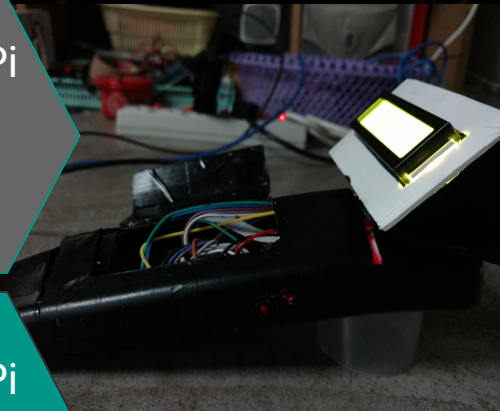
Material and  
other costs  
~Rs. 1000

VS

Laser  
Scanner  
Rs. 3500

Computer  
System  
Rs. 35000

Computer  
Operator's  
salary  
~Rs. 2000





A hand is holding a fiber optic inspection scope in a dark room. The scope's light source is illuminated, casting a bright yellowish-green glow. The scope is positioned over a document that has several barcode-like patterns on it. The document is illuminated by a bright, circular light source, likely the scope's light, which creates a strong contrast with the surrounding darkness. In the background, there are blue and yellow cables, suggesting a network or data center environment. The overall scene is dimly lit, emphasizing the operation in low light conditions.

Operation in low light conditions

A person is working on a small, rectangular device with a screen and buttons. The device is placed on a surface covered with various papers and documents. One of the papers has the text "ENDANCE SYSTEM" and another has "PR". A jar of Vaseline is visible in the background. The person's hands are visible, and they are wearing a yellow and red wristband. The overall scene suggests a design or prototyping process.

## Ergonomic design and button placement

# CONCLUSION

We have designed a targeted product which:

- Is cheap and compact.
- Increases convenience of the customers at small retail stores.
- Does not require any special installation or operator.



# THANK YOU

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SRJ 163

Final year

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