

Project Proposal

Team CheckItOut

Business Opportunity

We strive to deliver a fast automatic checkout system and inventory management system using AI and machine learning algorithms, including but not limited to computer vision, sensor fusion and deep learning, UV sensors creating an extensive database with analytics and insights on consumer behaviour, to high-end supermarkets and hypermarkets in Tier-1 cities, which can streamline the otherwise tedious and lengthy checkout system and make it more efficient, using payment methods with blockchain technology, effectively integrating the e-commerce and physical stores retail experience, thus reducing the cost incurred by the store in various channels and improving revenue through data insights.

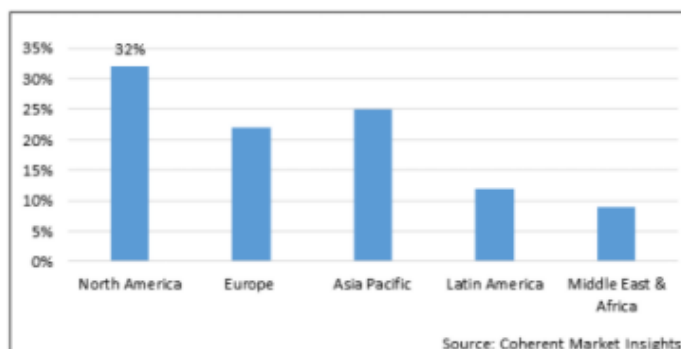
Market Research

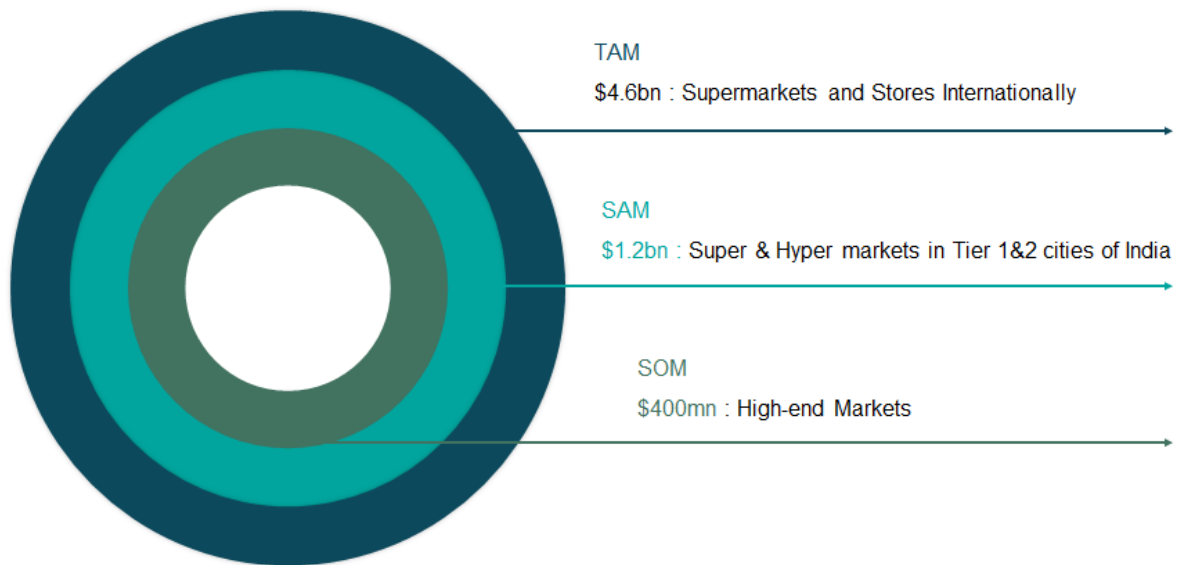
The Total Addressable Market, i.e. total market for self-checkout systems which comprises of the supermarkets, hypermarkets and small stores around the world is estimated to be around \$4.6 Billion in 2021 and the sector is forecasted to have a growth rate of around 13.3% (CAGR) from 2020 to 2027. The total revenue forecast is estimated to be \$7.8 Billion by 2027.

The Serviceable Addressable Market, which comprises the supermarkets and hypermarkets in tier 1 & 2 cities in India in our case, is estimated to be around \$1-2 Billion by 2027, which we plan to capture in the near future. These higher end supermarkets and hypermarkets would serve as our first customers. We have a lot of growth potential in this sector as the market in our region is still in its infancy, to support this statement; here is the chart that depicts the market share of self-checkout systems.

The Serviceable Obtainable Market which are the high-end markets of India comprise of a total of \$400 million right now.

Figure 1: Global Self-checkout System Market Share (%), in terms of Value, By Region, 2019





Target Market

Customer Profile

We focus on capturing retail outlets that can adopt the automated checkout system. These include the supermarket and hypermarket chains in the tier 1 & tier 2 cities. We plan to start with Mumbai as our central location, preparing us for tier 1 cities encompassing Bangalore, Delhi, Chennai, Hyderabad, Pune and Kolkata, and later expanding to Tier 2 cities. Such High-Profile markets tend to focus on consumer comfort and consumer experience, and CheckItOut manages to solve the problem these stores face of checkout lines being insanely long and the cashiers being inefficient in clearing out the queues. Here, the goal is to reduce costs by saving the wages and salaries paid to the staff associated with checkout at the store. Moreover, the robust inventory management, accounting, and payments set the store apart from its competitors.

We toyed with the idea of having automating the various Dark Store set up all over India, but through customer discovery concluded that these stores are technologically very backwards and automating a system that is otherwise working well would not only require a lot of resources but would also produce poor margins and overall wouldn't benefit us or our customers.

Consumer Profile

The end consumers of the service are the people who purchase at the stores mentioned in our customer profile and use the checkout systems. Their need is to reduce the time spent on checkout lines and save their time and energy. The seamless checkout process satisfies this segment extensively, resulting in a positive feedback loop that impacts the growth of the stores which employ our technology.

Value Proposition

The need for a seamless checkout process and a system to facilitate the same comes from the idea that on an average, the current physical checkout system takes about 15 mins and the waiting time varies from 30-45 minutes based on the rush that day. Our seamless checkout system resolves this issue of waiting in long queues during checkout from malls, supermarkets and other stores.

#A convenient and easy method to shop which encourages consumers to visit stores, increasing revenues for the stores

“Check it Out” provides value to both the consumers in terms of their experience and saves them a lot of time, and for the businesses (supermarkets and hypermarkets) in terms of reducing costs. Customers save a lot of time that would have otherwise been spent on waiting in long lines and the clumsy checkout process. This would have a wider impact. For example, if a mall has a theatre in it and is equipped by our checkout system, consumers would be more likely to go to that particular mall for the seamless experience offered and to save their time, this not only benefits stores in malls but also benefits the theatre, therefore increasing revenue for the theatre as well as for that mall.

#Competition with online shopping stores

A person will want to go to supermarkets with his/her friends and families not only for the sole reason of shopping but to spend time and enjoy. People find the offline shopping experience more gratifying since the sense of touch and vision is used to immerse them and give a more wholesome experience rather than sitting at home and scrolling on the phone to buy things.

After the Covid pandemic and lockdown, people are seen coming out and spending time outside in most of the urban and rural centres which is clear proof that people want to go out and not just be confined in their home. Further e-commerce comprises of 8-9% of the retail market in India today which is still small.

So, offline shopping is not going anywhere. It will be there along with online shopping and hence our automated billing system will not be outdated in near-future.

#Stores would no longer have to hire staff and pay salaries to the cashiers, billing staff and bagboys. Stores don't need software, machines for billing and inventory management

Expanding on the cost-saving, our product comes with a great opportunity to cut costs spent otherwise on staff salaries to the cashiers, billing staff, bagboys and replace it with a way more efficient and foolproof system for checkout and payment. This further saves the cost of billing machines and business management software clients/ payroll management clients. Note that the automation provided eliminates all the scope for marginal human errors which are ubiquitous otherwise.

#This will provide a more personalized shopping experience to the consumers with product 'FIND' feature on the app. Insightful consumer analytics for increasing the revenue of the store. By integration of Machine Learning and Artificial Intelligence we also provide customised recommendations that learns from a user's previous buys and gives recommendations based on Insightful customer analytics . We aim to provide them with various other functionalities like a "Find " feature in the application that can be used to easily locate any particular product which one wishes to buy.It can find and locate the nearest store where the product is sold and available. This provides the user with a personalized experience while surfing through the supermarket like never before.

#For dark stores,the delivery times are decreased thus increasing revenue

In times of rise of e-commerce, the companies compete on the delivery times being offered. The faster the better. Consumers need the quickest possible delivery times when it comes to goods and commodities. We aim to extend our product to dark stores in the future where we aim to provide a similar (if not identical) system to update inventory each time a delivery official checks out a product from a dark store. This eliminates the need for existing procedures and reduces the delivery times substantially.

Competition and Differentiation

Currently, there are a very few players who are tapping the potential of truly automated stores with self checkout features. Some of them include the Amazon-Go stores located in the USA, Ai-Fi - which provides retail solutions to make existing stores automatic. Other similar ventures include Grabango, MishiPay, Shopic, Caper etc who are new age startups exploring this space, but most of these lack scalability and cost effectiveness.

Our solution is unique in this regard. For instance, The Amazon - Go and Ai-Fi stores use an insane amount of sensors and sophisticated systems to track the customers in the store which leads to the cost of the store blowing up but at a disproportionate gain. Whereas our solution is clean and simple which can be readily implemented at any store for a much lower cost compared to our competition while preserving the customer experience. This can be an added benefit while acquiring new customers.

The below chart shows the competitive advantages of CheckItOut when compared to traditional shopping options as well as some of the high spec peers such as the Amazon-Go stores.

	Normal shops	Online Shopping	Amazon Go like Store	Shops with CheckITOut
Shopping Experience				
Contactless Shopping				
Reduced Billing Time				
Initial CapEx	NA	NA		
Analytics and Insights				

Experience

The consumer experience at CheckItOut would be seamless, as the entire checkout process would be facilitated in the bay cabin automatically and the customer only has to approve the payment before leaving the store, moreover the incentives to a store owner for switching to CheckItOut based system would outweigh the minimal cost as his regular cash-flows towards maintaining manual staff at the store would be completely eliminated. An added benefit to the store would be the robust data analytics that we provide which can potentially boost his sales and help serve his customers better than ever.

Key Partners

Our solution is reliant on utmost support from store owners and their staff for a successful execution of our full-fledged automated checkout system in their corresponding super stores. Primarily, we require manufactures for the customized full size bay cabin. This cabin could be standardized or be moulded based on customer requirements.

Other than that, for high accuracy, we need precision camera manufactures and partners for their manufacturing, assembly and the successful installation of these systems. As the basic technology is Sensor fusion with AI integration, companies with great success in these niches are necessary for good implementation.

We also provide consumer analytics to our customers, and hence storing, updating and modifying data continuously and quickly is essential for which we would require Database Management and Hosting services, along with competent and skilful data analysts. We would also employ several payment gateways Paytm, Google Pay, etc. for hassle-free checkout and a completely automated process.



Channels

Our primary channel is to sell the software-integrated hardware for the checkout system directly to our customers. For this, we plan to build professional websites and app which would benefit both, the customers and their consumers.

The website would be the first place of visit to get an insight on our product. Website contains positive feedback and testimonials from customers who are already using our product and increasing their revenue. Chatbots can be used for self-customer care in case of a customer facing some minor issues. Otherwise they can reach out to us through phone calls in case they face a major issue with the checkout system.

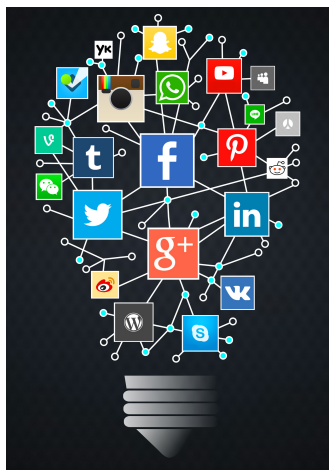
Social media marketing strategies along with television commercials would be employed to get a strong kick-start, but word of mouth promotion amongst our customers would attract certain incentives and discount on our subscription plans.

Further, it can be done that the CheckItOut app that would be used by the end consumers would have promotions of other such hypermarkets which have this automated system, thus informing the consumers about more of our clients.

Customer Relations

High-end supermarkets and Hypermarkets in Tier-1 cities, with well-equipped physical stores and working websites, would be our main potential partners. We aim to use IIT Bombay's extensive alumni network to get in contact with these stores and pitch our services to them. We also plan to approach the appropriate trade associations pertaining to our customer base and expect to create a good client base through word of mouth.

We also plan to offer a monthly review-based system to our customers, aiming to customize and personalize our services according to their needs.



Key Activities and Resources

CheckItOut aims to develop a seamless checkout system to resolve the issue of waiting in long queues during checkout from malls, supermarkets and other stores. We envisage the following activities:

The Checkout System: A full-sized bay-cabin with sensor fusion technology is installed at the exit of stores. It is equipped with AI based object detection and identification, automated billing system to boost the speed of checkout process making it hassle-free.

CheckItOut App: Customers can download our all-in-one mobile app to verify their purchase and make payments on-the-go. App provides customised recommendation that learns from customer's previous buys and gives recommendation accordingly. "FIND" feature of the application can be used to find and locate the nearest store where the product that customer wishes to buy is being sold.

Analytics: Consumer data analytics provided to the store management about the consumers' buying preferences and patterns by our company for a fee and helps provide shops with insights about the products and items which they must buy and optimise their inventory according to customer needs to increase revenue and profits for their business. Since data analytics is emerging fast in India, we could pioneer the use of it in the high-end retail industry right on the edge, where the industry meets the consumers.

Card based Payment: The system is integrated with card based payment methods and online payment methods to ensure a smooth, fast and contactless billing experience for the customer.

Maintenance: The development, deployment and maintenance of this highly accurate systems, sensors and the machine is one of the most important activities we do. The AI algorithm/model will be constantly upgraded and updated. It is the single most important asset for us as a company which enables us to make the fast and hassle-free billing possible. Manufacturing the physical machine and installing it on the shops is also done. Apart from this inventory management to eliminate the need for third party software being used, thus reducing expense and improving the overall service offered.



Financial Value Proposition

For Store Owners :

- SaaS model - @ Rs. 1.50 lakhs / month (average) per store
- Higher customer footfalls due to seamless and automated billing
- No upfront Capital expenditure
- Inventory data (real-time) available
- Automated Physical inventory – savings on Audit costs
- Automated procurement planning – based on Economic order quantity and other inventory control levels
- Data on customer preferences / ordering pattern / insights on spending etc.

For B2C Customers:

- Zero-cost (discounts and coupons would exceed ₹200 /annum charge) utilisation of the card
- Seamless billing – no waiting time for billing at the counters, Time Saved is Money Earned.

Revenue Streams

Monthly Revenue from Store Owners

Since the system totally eliminates the read-bar-code and check-in of a consumer system, we provide the customer with the data analytics and insights for the business, as a database of its sales, customer profile, inventory maintenance etc. A fee would be levied upon the customer for the above-mentioned functionalities.

An Annual Maintenance Contract is to be implemented with the customer, covering the software and hardware related repairs and maintenance. The AMC would include all software and hardware provided to the customer.

Annual subscription (upfront) from customers

An annual subscription service for customers who purchase in shops with CheckItout in our app to avail discounts, information on stock availability and prices in our partner stores and shops.

Allied Streams (not considered in the Financial projections)

- Co-Marketing Revenue [with Store owners & Merchandisers]
- Revenue share from Payment Gateway
- Out-licensing Fees

Financial Projections

Financial SNAPSHOT - 5 YEARS

	2022	2023	2024	2025	2026		2022 - 26
UNIT ECONOMICS							
REVENUE STREAM - 1 - STORES SUBSCRIPTION - SaaS MODEL							
							₹ in Millions
No. of Stores	7	13	22	30	50		
REVENUE per STORE @ ₹ 1.50 lakhs per month (Subscription)	12600000	23400000	39600000	54000000	90000000		219.60
Costs of Goods Sold (Direct COSTS) - includes UV Sensors, codes, back-end Data Management software etc. @ 40% of revenue	5040000	9360000	15840000	21600000	36000000		87.84
GROSS MARGIN	7560000	14040000	23760000	32400000	54000000		131.76
GM % age	60.00	60.00	60.00	60.00	60.00		60.00
OVERHEADS + SG&A + Promoters' Time Spent @ 40% of Gross Margin	3024000	5616000	9504000	12960000	21600000		52.70
DEPRECIATION [No Borrowing - No Interest] @ 8% of Revenue	1008000	1872000	3168000	4320000	7200000		17.57
Net Profit / Loss - Stores Software revenue stream	3528000	6552000	11088000	15120000	25200000		61.49
Net Profit / Loss % age	28.00	28.00	28.00	28.00	28.00		28.00

UNIT ECONOMICS							
REVENUE STREAM - 2 - Subscribers (customers) of Platform - SaaS MODEL							
							₹ in Millions
No. of Subscribers	140000	260000	440000	600000	1000000		1000000
REVENUE per customer @ ₹200 / year - from Ads, sponsorship, promotions etc. with 5% esc.	28000000	54600000	96800000	138000000	240000000		557.40
Costs of Social Marketing, goodies, promotions, Advertisements etc. @ ₹80/ customer/yr	11200000	21840000	38720000	55200000	96000000		222.96
Development & Maintenance of platform, apps etc. @ 30% of revenue (2)	8400000	16380000	29040000	41400000	72000000		167.22
GROSS MARGIN	8400000	16380000	29040000	41400000	72000000		167.22
GM % age	30.00	30.00	30.00	30.00	30.00		30.00
DEPRECIATION [No Borrowing - No Interest] @ 8% of Revenue	2240000	4368000	7744000	11040000	19200000		44.59
Net Profit / Loss - Customer platform subscription stream (2)	6160000	12012000	21296000	30360000	52800000		122.63
Net Profit / Loss % age	22.00	22.00	22.00	22.00	22.00		22.00
Net Profit / Loss of the Enterprise	9688000	18564000	32384000	45480000	78000000		184.12
Corporate Income Tax @ 36% of PBT	3487680	6683040	11658240	16372800	28080000		66.28
Profit After Tax	6200320	11880960	20725760	29107200	49920000		117.83
TOTAL REVENUE From both streams	40600000	78000000	136400000	192000000	330000000		777.00
₹ in Millions	41	78	136	192	330		777
Net (after TAX) Profit / Loss % age	15	15	15	15	15		15.17
CAC / year with escalation of 5 % YoY	80	84	88	92	96		88
Net income per customer / year	200	210	220	230	240		220
Customer Payback period	2 1/2 months						
LTV per customer - over 15 year period (net) - Undiscounted	3300						

Cost Structure

The software cost depends on the technology evaluation in the R & D stage of production. This charge would vary significantly based on the inventory and customer traffic of the store. The bay billing system would be equipped with UV Sensors and cameras for logging and bill generation, which would include manufacturing costs.

Software and algorithm development for data analytics would also be borne in the inception cost. Apart from that, inventory maintenance, sales information, customer profile, etc would be maintained on an online Database system, providing information to each customer.

Other major Costs:

- Ink & consumables
- Royalty to patent holder
- Back-office coding space & Billing bay etc. to be provided by the store

Project Development and Timeline

- Development of the Technology & Platform: 31st December '21
- 6-sigma Beta testing completion: 20th February '22
- Live testing at Development-Partner Stores (2):15 days (until 7th March '22)
- Go Live!: 16th March '22

Funding

Our company will require a funding of \$2M to develop the product and expand its base in the early stages that is the first 2 years of its operation. We require the funding primarily for two purposes:

Seed Funding: roughly 75% of total funding will be needed for setting up the company and will be essential for development purposes. This will provide funding for the salaries of the development team and other costs required in development.

Remaining capital will be instrumental in developing a market base and the startup's expansion. These will be used for advertising and marketing i.e attracting the customers and hence getting a break into the market.

Initially we plan to get basic investments and mentorship under the SINE Incubator and the IDS program at IIT Bombay. In later phases we plan to attract funding from the

Institute's alumni network and attract investments from other investors primarily Angel Investors and Venture Capitalists. Other than that we plan to attract funding through selling out shares and through giving out stocks to our employees.

Team CheckItOut

Atul Verma - 19B090004
Ayushman Choudhary - 200020039
Balasubramanian - 200050103
Mugdha Bajpayee - 200100099
Rangarajan R Iyengar - 214278002
Vidit Goel - 200051056
Vishruth N - 200010088