invention labs

ENGINEERING PRODUCTS PRIVATE LIMITED

A concept Indian Vending Machine

Product Brief

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Introduction

This document describes some functional specifications and targeted deployments of a Vending Machine that Invention Labs is working on, for various applications within India.

The term 'vending machine' here refers to a machine that accepts payments, and dispenses a product or service. The item dispensed by the machine may be a beverage, a snack, a ticket, a receipt for a payment, or simply change for a larger denomination of currency.

Such machines are common in Western countries and Japan; however, they are yet to gain a major presence in India. This document discusses some of the reasons for this, and describes the features and innovations of our vending machine that will make it an appropriate fit for India, and thereby a commercial success.

Since many of the applications of vending machines abroad may not be appropriate in an Indian scenario, this document also describes some of the scenarios that we see our vending machine fitting into.

This document concludes with a discussion of the time frames associated with the creation and delivery of this product.

Why are vending machines so uncommon in India?

Vending machines are used all over the world for dispensing a variety of products; however, in India, vending machines are few and far between. We believe that the reason vending machines are not popular in India stems mainly from the lack of these machines that have been designed exclusively for an Indian environment; because of the uniqueness of India, machines designed for use abroad do not necessarily find a place in India. Existing vending machines in the world are

not suitable in India because of the following reasons.

1. **Currency recognition technology is more difficult.** India has a much greater diversity of currency, both coins and notes, compared to most Western countries. As a result, the same coin and note recognition techniques that are used for currencies such as the dollar and the yen do not extend themselves to Indian currency. For this reason, vending machines deployed in India are unable to accept more than one particular kind of coin (such as a five-rupee coin or a 1-rupee coin). This is a major hassle both for the customer, who must have the right kind of change, as well as for the vendor whose products are being sold, because he is forever locked to one particular price for his product. This is one of the main reasons that vending machines have not picked up in India.

2. **Labor is a cheaper alternative.** India has one of the cheapest labor forces in the world for unspecialized jobs such as vending of products or selling of tickets, which are functionalities typically performed by a vending machine. In countries abroad, vending machines that dispense beverages like coffee are ubiquitous because it is expensive to employ a person to fulfill such a role; in India, however, it would be naïve to expect people to start using vending machines when they can get cheap coffee, tea, cigarettes from roadside vendors. For a vending machine to displace an equivalent human vendor, it must not only be capable of performing all the duties that a vendor would perform, but must also be substantially cheaper to install and maintain than employing labor.

3. **Environment is more rugged.** In countries abroad, vending machines are typically present in environments where the temperature and humidity are controlled, and where security and vandalism are not particular issues. In India, the operating environment for such machines is substantially more demanding, and the machine must be well protected from would-be vandals.

4. **Security needs are more stringent.** A related concern in any vending machine is security, which takes on three aspects. First, the currency that is stored within a vending machine must be secured, and the machine itself must be resistant to theft. This aspect of security is important to the vendor who has invested in the machine. Second, the contents of the machine must be tamper-proof – for example, no one must be able to contaminate the beverage that a soft-drink vending machine may dispense. This aspect of security is important both to the vendor and the customer of the product. Thirdly, the machine must guarantee that a product will be dispensed when a customer puts money into it, and must not 'steal' customers' money through malfunction in any circumstances. This refers to a customer's feeling of security when dealing with a machine instead of a shopkeeper. All of these concerns are very inadequately addressed in vending machines in India today.

5. **Current vending solutions do not offer the same convenience as from a shopkeeper.** Indians are accustomed to personalized service in shops in India, and expect the same level of convenience from a vending machine also. For example, a vending machine must be able to make change and offer a variety of purchasing choices, just as a shopkeeper would. A vending machine must also require minimum maintenance, and guarantee maximum uptime, in order to gain widespread public use. Vending machines in India are technologically far from satisfying these conditions today.

6. **Culture is more conducive to human relationships.** For several products in India, such as coffee, vegetables, beverages etc., there exists a relationship between the customer and the shop-keeper today. It is unlikely that a customer will switch over to purchasing from a machine when such a relationship exists. The fundamental issues of trust, redressal of grievances, assurance of quality etc. are social issues that impede the adoption of vending machines in India.

From these reasons, two conclusions are evident: first, that vending machines may be deployed widely in India only for certain products and services and not others; and second, that the main stumbling block for vending machines in India appears to be the immaturity of available technology.

Invention Labs aims to address the second point in substantial measure, and aims to partner with the appropriate vendors to address the first point satisfactorily.

The Invention Labs' Vending Machine

Since all vending machines have, at their heart, the same technology that validates, distinguishes and segregates currency and dispenses a product, our invention is not so much a *specific* vending machine as it is a vending machine *core*. The core provides a mechanism for customers to make payments and dispense the product based on a signal, which will be generated by our invention.

In order to be commercially successful in the Indian market, our vending machine has several unique and innovative features that other machines from other manufacturers do not offer. The following section describes some of the most salient features of our product.

Features of Invention Labs' Vending Machine

1. **A branding and advertising medium:** Vending machines offer a novel advertising medium for an FMCG company. A multimedia interface would play advertisements (video and audio) and the consumer would have the option to try the product right then and there! Imagine seeing an advertisement on your TV and then pressing a few buttons on your mobile phone and the TV opens up to give you this product!

2. **Innovative payment mechanisms:** As non-cash payment systems like mobile payments and credit cards gain traction in India, it would make sense for a vending machine to use these innovative payment mechanisms rather than the traditional cash-based transactions. The use of mobile phones / smart cards also provides the retailer with the added opportunity of offering promotions and loyalty-based points.

3. **Convenience of storage and collection:** Ensuring availability of products in the vending machine is a major operational issue. Invention Labs' vending machine comes inbuilt with alerting mechanisms that could be easily integrated to a retailer's supply chain systems so that the entire replenishment cycle could be automated.

4. **Ruggedness:** Our machine is sensitive to Indian requirements, and is built to protect it from dirt, grime, smoke and extremes of weather. It is built with robust parts that render it, for the most part, repair-free. The machine itself is designed to be safe from sabotage and vandalism. The machine is also designed to maintain purchase records across power failure, and automatically recovers to a stable state in the event of a power loss. In case there are any problems, the machine is designed to display diagnostic information for easy serviceability and maintenance. The aim is to minimize intervention by service personnel, as well as downtime for the machine, maximizing profit for vendors who use it.

5. **Convenience for the customer:** Our machine has several features that go a long way in improving convenience for a customer. For example, the machine is user-friendly, displaying prompts and messages in multiple Indian languages Provision is provided for printing receipts, if required. The machine provides audio feedback for customers who are unable to read messages on the display.

6. **Convenience for the vendor:** The machine has several features that are designed for the convenience of the vendor deploying it. These include features that track and collect

information, such as the amount of money collected, and statistics, such as the times and quantities of purchase of various products. The prices of various products are programmable. The system is peripheral-extensible, so that options such as a security camera, fingerprint detection etc. can be added. Care has also been taken to load and unload currency and goods in the machine. The machine is flexible to the extent possible in terms of actual goods dispensed, so the vendor can replace the product line being sold by the machine.

7. **Cost effectiveness:** At every stage of product design, the vending machine has been designed to be as cost-effective as possible for a customer. It is manufactured with standard components available off-the-shelf, and so it is inexpensive to produce – and affordable to buy.

8. **Future plans:** Future versions of the machine will include several attractive features, such as intelligence to generate impulse purchases, additional payment channels, interfaces for recording customer complaints, support for battery operation, greater security protection, and much more.

Sample installations of the vending machine

In an Indian scenario, there are very specific areas that a vending machine may be deployed in. Social and environmental issues make it impractical to deploy the machine in several areas that they are traditionally used for in other countries. This section describes some possible applications for Invention Labs vending machines.

1. **Dispensing tickets:** Queues are an unpleasant reality in India, and vending machines are a ready solution to ease this problem. In railway reservation counters, for example, a vending machine would be able to significantly reduce the time taken for a customer to purchase a ticket, allowing human ticket-sellers to concentrate on providing special services such as cancellation, bulk booking etc. Similarly, in cinema theaters and similar venues, where the interaction between the ticket-seller and the customer is minimal, dispensing tickets through a vending machine is an attractive option for decreasing the queue length.

2. **Automatic teller machines (ATMs):** ATMs in India typically allow withdrawals – but do not allow deposits, or do not allow deposits to take immediate effect. This can be mitigated through the use of a modified 'vending machine' integrated into an ATM. By means of such integration, banks will be able to accept deposits from their customers, thereby providing a significant benefit especially in rural areas and areas that are far from bank branches.

3. **Bill payment:** Vending machines may be used to pay a variety of bills, such as electricity, phone, cell-phone and credit card bills, giving customers the convenience of being able to pay at any time, and decreasing the cost associated with this operation for the billing company.

4. **Counting currency in temples:** In several big temples, donations by patrons into *hundis* are counted painstakingly in a process that takes several hours and is prone to mistakes. The use of a vending machine core in such areas allows for automation of this exercise, greatly decreasing the time spent on this operation.

5. **24-hour retail:** There are not many stores in India that are open 24 hours a day, mainly because of social reasons. However, there is a demand for certain stores, such as pharmaceutical retailers, to remain open always. Vending machines provide the perfect solution in such cases, allowing the vendor to continue his or her business even when employees are not present in the store.

The above examples provide a small sample of applications that vending machines may be put to in India if they are properly designed.

Time frame for the vending machine

The vending machine is currently in an active state of development. The following dates are indicative of major landmarks in the design and delivery of the machine:

31st December 2008 (Q4 '08): First prototype of the vending machine to be demonstrated, with smart card-based payment systems, local language text and audio interface.

31st March 2009 (Q1 '09): Design and delivery of the vending machine to partners for field trials and evaluations.

31st June 2009 (Q2 '09): Rollout of vending machine version 1.

31st August 2009 (Q3 '09): First prototype of version 2 of the vending machine, supporting advanced features requested for by customers and vendors.

31st December 2009 (Q4 '09): Rollout of vending machine version 2.

We are currently accepting expressions of interest in the vending machine, and are actively soliciting vending partners who are interested in deploying a vending machine to improve their sales and expand their business. Mail us at products@inventionlabs.in for more details.

Conclusion

As organized retail seeks to expand its footprint across the country, vending machines offer a convenient platform to scale rapidly at a fraction of the cost required to set up retail stores. They could also offer FMCG companies an alternate distribution format apart from the regular kirana stores and supermarkets.

As customers demand more and more, and as technology is increasingly being seen as an alternative to traditional practices, the prospects for a truly Indian vending machine can only improve. With a solution that offers flexibility, convenience, security and cost savings for both the vendor and the customer, Invention Labs' vending machine is poised to usher India into a new era of retail vending – the Technology era.

About Invention Labs

Invention Labs is a company that is aimed at leveraging cutting edge technologies around the world to solve India's growing engineering problems. We aim to build products that are aware of Indian sensibilities and tuned to work best in the Indian environment without compromising on quality, ease of use, reliability and technological superiority. It was started by alumni of the Indian Institute of Technology, Madras, who also studied and worked in the USA after their graduation. Invention Labs is supported by the Indian Institute of Technology, Madras (www.iitm.ac.in), and the TeNet group (www.tenet.res.in).

More about Invention Labs may be found at our website: www.inventionlabs.in.