PRINCIPALS OF CODING

Vending Machines

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Introduction

Automated machines known as vending machines are made to supply products to customers whenever they need them, usually in return for cash, tokens, or electronic payments. These devices are frequently seen in a variety of public spaces, including malls, train stations, airports, schools, and offices. They provide easy access to a large selection of Products.

Objectives

Generally, a vending machine's objectives are:

1. Convenience: facilitating rapid and simple product access without requiring assistance from a human.
2. Accessibility: Providing products in places where traditional retail may not be practical.
3. 5. Customer satisfaction: Providing a dependable and easy-to-use service that caters to the needs and preferences of customers.
4. 6. Inventory management: keeping an eye on supply levels and restocking products as necessary to guarantee availability.
5. 7. Cost Control: Optimising profitability by controlling running costs like refilling, maintenance, and energy use.

Scope

The range of vending machines includes several things, such as:

1. Product Selection: A vast array of goods, such as snacks, drinks, cooked meals, personal hygiene products, and even gadgets, can be purchased from vending machines.

2. Locations: Office buildings, schools, hospitals, airports, train stations, retail centres, and public areas are just a few of the places where they might be positioned.

3. Technology: Cash, coins, credit/debit cards, mobile payments, touchscreens, biometric authentication, and other technologies are all used by vending machines for payment processing, inventory management, and user interface.

4. Customisation: A few vending machines allow users to choose from a variety of product alternatives and even add their own names to goods like snacks or drinks.

5. Maintenance and Service: To guarantee optimum performance and client pleasure, vending machines need to be serviced, restocked, and maintained on a regular basis.

Testing Approach

There are several methods used in vending machine testing to make sure the devices are reliable, functional, and easy to use. Here are a few typical testing strategies:

1. **Functional Testing:** Confirm that the vending machine dispenses the right goods, correctly processes payments, and reacts to user inputs (such as button presses and touch inputs)
2. **User Acceptance Testing (UAT):** Incorporate stakeholders or end users to confirm the usability, accessibility, and general user experience of the vending machine.
3. **functionality Testing:** To guarantee reliable and seamless operation, test the vending machine's functionality in a variety of scenarios, including heavy traffic, chilly temperatures, and power outages.
4. **Security Testing:** Evaluate the security features of the vending machine, such as data encryption, payment processing security, and resistance to vandalism and tampering.
5. **Integration Testing**: Confirm integration with backend systems, including payment and inventory management.

Risks and Assumptions

Vending machine-related risks and presumptions include:

1. **Technical Malfunctions**

Assumption - There won't be any major technical problems with the hardware and software of the vending machine.

Risk - Technical issues could arise and cause downtime and income loss. Examples of these issues include coin jams, product jams, touchscreen malfunctions, or software bugs.

2. **Security Concerns**

Assumption - The payment processing system of the vending machine is safe and secure, safeguarding the payment information of users.

Risk - Unauthorised access, fraud, or the theft of private information could result from security lapses or flaws in the payment processing system.

3. **Product Accessibility**

Presumption - There will always be enough stock in the vending machine to satisfy consumer demand.

Risk - Unexpected surges in demand, theft, or logistical problems can cause out-of-stock situations, which can result in disgruntled customers and lost sales.

System Tests

Operation (Task)	True	False
1. All the buttons are working perfectly.	Yes	
2. Scanning products according to customer requires	Yes	
3. Total calculating functions working correctly	Yes	
4. Providing change to customer correctly	Yes	
5. Display the error massage correctly according to system error or Human error.	Yes	
Over roll Results	100%	

Test Procedures

1. Carry out each unit test scenario, making sure that every part operates as intended when separated.
2. Conduct integration tests to confirm how various components interact with one another.
3. Run system tests to confirm that the system functions as intended from beginning to end.
4. Keep a record of the test findings, including any errors or non-expected behaviour.

Test Environment

1. Programming Language: Python 3.12.2
2. Development Environment: Python IDE or VS Code
3. Operating System: Any OS supporting Python 3.12.2

Conclusion

In conclusion, because they provide accessibility, ease of use, and adaptability in terms of product distribution, vending machines are an important part of contemporary retail. We may anticipate more innovation and growth in the future in terms of vending machine capabilities and applications as technology develops.

Additionally, there is an increasing emphasis on sustainability, as seen by the inclusion of recyclable materials, energy-efficient parts, and eco-friendly materials in vending machines.