International journal of imaging science and engineering

ISSN: 1934--9955 www.ijise.net

Vol-20 Issue-01 Mar 2025

ONLINE INVENTORY MANAGEMENT SYSTEM

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***Abstract*- This project is aimed at developing a desktop based application named Inventory Management Systemfor managing the inventory system of any organization. The Inventory Management System (IMS) refers to the system and processes to manage the stock oforganizationwith the involvementof Technology system. This system canbe used to store the detailsof the inventory, stock maintenance, update the inventory based on the sales details, generate sales and inventory report daily or weekly based. This project is categorize individual aspects for the sales and inventory management system. In this system we are solvingdifferent problemaffecting todirect sales management and purchase management.Inventory ManagementSystem isimportanttoensurequalitycontrol inbusinessesthathandletransactionsresolvingaroundconsumergoods. Withoutproper inventory control, a large retail store may run out of stock on an important item. A good inventory management system will alertthewholesaler whenitis timetorecord. AnautomatedInventoryManagementSystemhelpstominimize the errors while recording the stock.**

***Keywords*- Insertion of new product, Updating product values, Deleting Product, Instant updation of values, Categorized Product Selection, Cart, Invoice.**

I. INTRODUCTION

An inventory management system is the combination of technology (hardware and software) and processes and procedures that oversee the monitoring and maintenanceof stocked products, whether those products are company assets, raw materials and supplies, or finished products ready to be sent to vendors.

Without an inventory management system, the goods and products that flow through an organization will inevitably bein disarray. Aninventorymanagementsystem enablesa company to maintain a centralized record of every asset and item in the control of the organization, providing a single source of truth for the location of every item,vendor and supplier information, specifications, and the total number of a particular item currently in stock.

Because inventory often consists of movable assets, inventory management systems are critical for keepingtabs on current stock levels and understanding what items move quickly and which items are more slow-moving, which in turn enables organizations todeterminewhen it's time to reorder with greater accuracy.

Our Inventory Management system Consists of following Modules: Login, Sales, Inventory, Settings, Exit. We used gui in that. we create inventory for medical store. In that we have put some products of medical store. GUIs enable interaction through clarity and control.

The primary objective of every GUI is to deliver the kind of clarity that will allow its users to rapidly beginengaging and interacting with it in meaningful ways. This doesn't mean that GUIs cannot be designed to introduce a sense of mystery and intrigue, but it is essential to avoid confusion.

1. DatabaseConnection:

We used sqllite3 for our system. SQLite3 can beintegrated with Python using sqlite3 module, which was written by Gerhard Haring. It provides an SQL interface compliant with the DB-API 2.0 specification described by PEP249. You donotneed toinstallthismoduleseparately becauseitis shippedbydefaultalongwithPythonversion

2. 5.xonwards.

To use sqlite3 module, you must first create a connection object that representsthe database andthen optionallyyou can create a cursor object, which will help you inexecuting all the SQL statements.We have used Python languages for developing the Inventory Management.

Languages used for development of Inventory Management:

Python: Python is an interpreted, object-oriented, high-level programming language with dynamicsemantics. Its high-level built in data structures, combined with dynamic typing and dynamic binding, make it very attractive for Rapid Application Development, as well as foruseasascriptingorgluelanguagetoconnectexisting

International journal of imaging science and engineering
ISSN: 1934--9955 www.ijise.net
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componentstogether. Python'ssimple,easytolearnsyntax emphasizes readability and therefore reduces the cost of program maintenance. Python supports modules and packages which encourages program modularity and code reuse. The Python interpreter and the extensive standard library are available in source or binary form without charge for all major platforms, and can be freely distributed.

Often, programmers fall in love with Python because ofthe increased productivity it provides. Since there is no compilation step, the edit-test-debug cycle is incredibly fast. Debugging Python programs is easy: a bug or bad input will never cause a segmentation fault. Instead, when the interpreter discovers an error, it raises an exception. When the program doesn't catch the exception, the interpreter prints a stack trace. A source level debugger allows inspection of local and global variables, evaluation of arbitrary expressions, setting breakpoints, stepping through the code a line at a time, and so on.

The debugger is written in Python itself, testifying to Python's introspective power. On the other hand, often the quickest way to debug a program is to add a few print statements to the source: the fast edit-test-debug cycle makes this simple approach very effective.It was created by Guido van Rossum during 1985- 1990. Like Perl, Python source code is also available under the GNU General Public License (GPL). Python is a MUST for students and working professionals to become a great Software Engineer specially when they are working in Web Development Domain.

I will list down some of the key advantages of learning Python:

- **Python is Interpreted:** Python is processed atruntime by the interpreter. You do not need tocompile your program before executing it. This is similar to PERL and PHP.
- **Python is Interactive:** You can actually sit at a Python prompt and interact with the interpreter directly to write your programs.
- **Python is Object-Oriented:** Python supports Object-Oriented style or technique of programming that encapsulates code within objects.
- **Python is a Beginner's Language:** Python is a great language for the beginner-level programmers and supports the development of a wide range of applications from simple text processing to WWW browsers to games.

CharacteristicsofPython:

Following areimportant characteristicsof Python Programming −

- Itsupportsfunctionalandstructuredprogramming methods as well as OOP.
- Itcanbeusedasascriptinglanguageorcanbe compiled to byte-code for building largeapplications.
- Itprovidesveryhigh-leveldynamicdatatypesand supports dynamic type checking.
- Itsupportsautomaticgarbagecollection.
- ItcanbeeasilyintegratedwithC,C++,COM, ActiveX, CORBA, and Java.

ApplicationsofPython:

As mentioned before, Python is one of the most widely used language over the web. I'm going to list few of them here:

- **A broad standard library:** Python's bulk of the libraryis veryportable and cross-platform compatible on UNIX, Windows, and Macintosh.
- **Interactive Mode:** Python has support for an interactive mode which allows interactive testing and debugging of snippets of code.
- **Portable:** Python can run on a wide variety of hardware platforms and has the same interface on all platforms.
- **Extendable:** You can add low-level modules to the Python interpreter. These modules enable programmers to add to or customize their tools to be more efficient.
- **Databases:** Python provides interfaces to all major commercial databases.
- **GUI Programming:** Python supports GUI applications that can be created and ported to many system calls, libraries and windows systems, such as Windows MFC, Macintosh, and the X Window.

2. SoftwareDevelopment:

A software development process (also known as asoftware development methodology, model, or life cycle) is a framework that is used to structure, plan, and control the process of developing information systems. A wide variety of such frameworks has evolved over the years, each with its own recognized strengths and weaknesses.

There are several different approaches to software development: some take a more structured, engineering-based approach to developing software, whereas others may take a more incremental approach, where software evolves as it is developed piece-by-piece. One system development methodology is not necessarily suitable for use byall projects. Each of the available methodologies is best suited to specific kinds of projects, based on various technical,organizational,project,andteamconsiderations.

Mostmethodologiessharesomecombinationofthe following stages of software development:

- Analyzingtheproblem
- Marketresearch
- Gatheringrequirementsfortheproposedsoftware
- Devisingaplanordesignfor thesoftware
- Implementation(coding)ofthesoftware
- Testingthesoftware
- Deployment

International journal of imaging science and engineering

ISSN: 1934--9955 www.ijise.net

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- Maintenanceandbugfixing

These stages are often referred to collectively asthe software development life-cycle, or SDLC. Different approaches to software development may carry out these stages in different orders, or devote more or less time to different stages.

The level of detail of the documentation produced at each stage of software development may also vary. Thesestages mayalso be carried out in turn (a “waterfall” based approach), or they may be repeated over various cycles or iterations (a more "extreme" approach). The more extreme approach usuallyinvolves less time spent on planningand documentation, and more time spent on coding and development of automated tests.

More “extreme” approaches also promote continuous testing throughout the development life-cycle, as well as having a working (or bug-free) product at all times. More structured or “waterfall” based approaches attempt to assess themajorityof risksand develop a detailed plan for the software before implementation (coding) begins, and avoid significant design changes and re-coding in later stages of the software development life-cycle planning.

There are significant advantages and disadvantages to the various methodologies, and the best approach to solving a problem using software will often depend on the type of problem. If the problem is well understood and work can be effectively planned out ahead.If, on the other hand, the problem is unique (at least to the development team) and the structure of the software cannot be easily envisioned, then a more "extreme" incremental approach may work best.

Developing software typically involves the followingsteps:

Selecting a methodology to establish a framework in which the steps of software development are applied: It describes an overall work process or roadmap for the project. Methodologies can include Agile development, Waterfall and others.

Gathering requirements: To understand and document what is required by users and other stakeholders.

Choosing or building an architecture: As the underlying structure within which the software will operate.

Developing a design: Around solutions to the problems presented by requirements, often involving process models and storyboards.

Constructing code in the appropriateprogramming language: Involves peer and team review to eliminate problems early and produce quality software faster.

Testing: With pre-planned scenarios as part of softwaredesignandcodingandconducting performance testing to simulate load testing on the application.

Managing configuration: To understand all the software artifacts (requirements, design, code, test) and build distinct versions of the software. Establish quality assurance priorities and release criteria to address and track defects.

Deploying the software: For use and responding to and resolving user problems.

Migrating data: To the new or updated softwarefrom existing applications or data sources ifnecessary.

Managing and measuring the project: To maintain qualityanddeliveryover theapplicationlifecycle,and toevaluatethedevelopmentprocesswith modelssuch as the Capability Maturity Model (CMM).

II. INVENTORYMANAGEMENT

1. VariousStepsconsiderinInventorymanagement Development Process:

Firstly we select a Waterfall Model for our Inventory management system.

The sequential phases in our Inventory Management Requirement Gathering andanalysis: All possible requirements of the system tobe developed are captured in this phase and documented in a requirement specification document.

System Design: The requirement specifications from first phase are studied in this phase and the system design is prepared. This system design helps in specifying hardware and system requirements and helps in defining the overall system architecture.

Implementation: With inputs from the systemdesign, the system is first developed in smallprogramscalled units, whichareintegratedinthenext phase. Each unit is developed and tested for its functionality, which is referred to as Unit Testing.

Integration and Testing: All the units developed in the implementation phase are integrated into a system after testing of each unit. Post integration the entire system is tested for any faults and failures.

Deployment of system: Once the functional andnon-functional testing is done; the product is deployed in the customer environment or released into themarket.

Maintenance: There are some issues which come up in the client environment. To fix those issues, patches are released. Also to enhance the product some better versions are released. Maintenance is done to deliver these changes in the customer environment.

All these phases are cascaded to each other in which progress is seen as flowing steadily downwards (like a waterfall) through the phases. The next phase is started only after the defined set of goals are achieved forprevious phase and it is signed off, so thename "Waterfall Model". In this model, phases do not overlap.

International journal of imaging science and engineering

ISSN: 1934--9955 www.ijise.net

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WaterfallModel–Application:

Every software developed is different and requires a suitable SDLC approach to be followed based on the internal and external factors.

Some situations where the use of Waterfall model is most appropriate are −

- Requirementsareverywelldocumented,clearand fixed.
- Productdefinitionisstable.
- Technologyisunderstoodandisnotdynamic.
- Therearenoambiguousrequirements.
- Ample resources with required expertise are available to support the product.
- Theprojectisshort.

WaterfallModel–Advantages:

The advantages of waterfall development arethat it allows for departmentalization and control. Aschedule can be set with deadlines for each stage of development and aproduct can proceed through the development process model phases one by one.

Development moves from concept, through design, implementation, testing, installation, troubleshooting, and ends up at operation and maintenance. Each phase of development proceeds in strict order.

Some of the major advantages of the Waterfall Model are as follows –

- Simpleandeasytounderstandand use.
- Easyto manage due to therigidityof the model. Each phase has specific deliverables and a review process.
- Phasesareprocessedandcompletedoneatatime.
- Workswellforsmallerprojectswhere
- requirementsareverywell understood.
- Clearlydefinedstages.
- Easytoarrangetasks.
- Processandresultsarewell documented.

2. ActualImplementation:

In our project we created a Inventorymanagement system which having the complete information of products and their sales.Thesoftwarewhich isdevelop with someideas andreusabilitythat mayhelpssome fresher to look around it and may show some interest against the inventory management by doing some enquiry through these software.

Here the data is arranged properly by which its updating will be easier in future as the requirement or demand increase towards the software. It contains updated and useful for data for the inventory management.We have used platform python for our Inventory management Thereare6modulesinour project:

- **First module** is login module. In that login modulewe have given the user name and password.When the admin enter correct username and password it will open the next window.
- **Second module** is open after theadmin enters correct usernameandpassword.Inthatmoduleweimplement 4 button i.e:- Sales,Inventory,extras,exit.And onemore button is for log out.
- **Third module** is Sales. When user clicks on sales button which is present in second module the sales window will open. In that window user can select product and add to it in the cart.After adding into the cart user will get their bill.And also user will get generated bill records after clicking on bill Records button.the bill records will be open in file explorer which is present in computer system.
- **Fourth module** is Inventory.When user clicks on Inventory button which is present in second module the Inventory window will open.In that it will show the all product list. There are 5 buttons named as Add Product, Select Product, View all Product, Update Product, Delete Product. When user clicks on add product it will add new product. When user clicks on Select Product it will select a product present in Product List. When user clicks on Delete Product it will delete a product.When user clicks on Update Product it will update the information of product.
- **Fifth module** is Extras. In that module user will change the password.
- **Sixth module** is Exit module.When user clicks onExit button it will close the system.

3. DesignsandScreenshots:

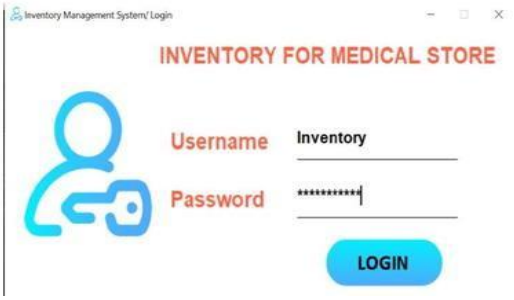

Fig1.Screenshot.

Fig2.Screenshot.

International journal of imaging science and engineering

ISSN: 1934--9955 www.ijise.net

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Fig3.Screenshot.

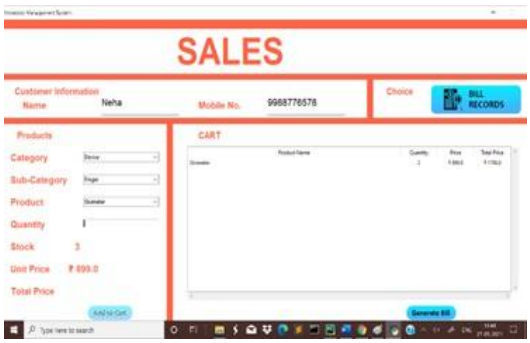

Fig 4.Screenshot.

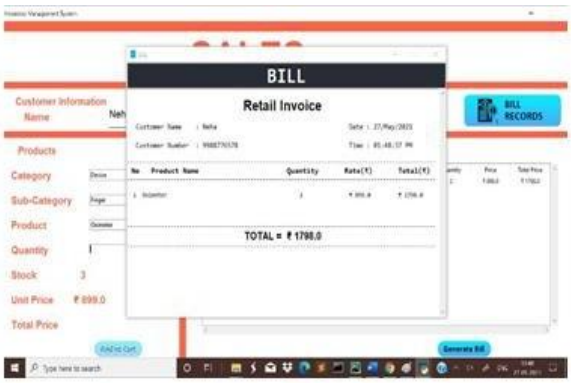

Fig5.Screenshot.

Fig 6.Screenshot.

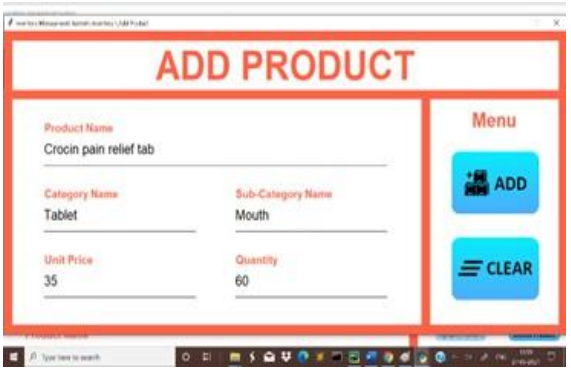

Fig7.Screenshot.

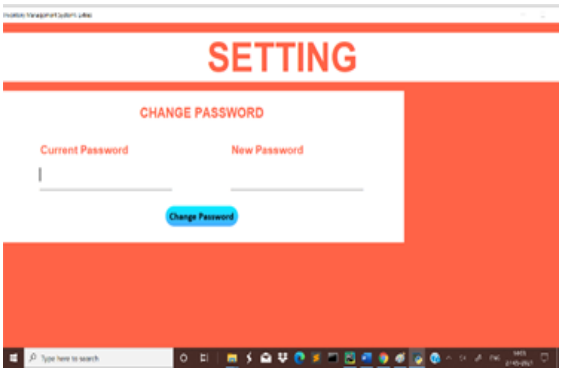

Fig8.Screenshot.

III. FUTURESCOPEANDCONCLUSION

1. FutureScope:

Determination of economic order quantity:- Economic order quantity or economic lot size refers to that number ordered in a single purchase or number of units should be manufactured in a single run, so that the total costs — ordering or set up costs andinventorycarrying costs areat the minimum.

Formulation: The policies of investment procurement, storage, handling, accounting, storages and stock outs, deterioration, obsolescence etc. are to be formulated under thescientificsystem ofinventory control. What, when andhowmuch ofpurchasingand fixation of minimum and maximum levels is also tobe determined for a given period of time.

Determination of lead time: By lead time is meant the time that lapses between the raising of an indentby the stores and the receipt of materials by them. Lead time is of fundamental importance in determining inventory levels.

Effectiveness towards running ofstore: The determination of policies of the location, layout and materials and storage handling equipments certainly help in the effective working of stores organization.

Organisations: After determining of inventorypolicy, the next step is to decide the location, layout andtypes ofstorehouse. Itfacilitates themovementof

International journal of imaging science and engineering

ISSN: 1934--9955 www.ijise.net

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materials and thus minimize the storage and handling cost of stores.

Safety: Safety stock is defined as the difference between theamount stocked to satisfydemand during a certain time interval and themean expected demand for that period. It is for the purpose of providing protection against depletion.

2. Conclusion:

In our project we have updated a Inventory Management system. For creating this software we have used programming language Python. By using these language, we learned the actual implementation of these language and we learnedhowtoapplythese language inreal life i.e. we learned real time applications of language and how to make a software responsive with better designs and less code entanglement.

IV. ACKNOWLEDGEMENT

Wewouldliketoexpressourgratitudetowardsguide Prof.DESHMUKHR.R.Fortheusefulcomments, remarksandforgivinghervaluableguidanceand inspiration throughout the learning process of this report. Furthermore,wewouldliketothankourHODProf. JADHAVP.Dfor makingavailableallthefacilitiesfor the successfulcompletionofthisworkandotherstaff membersofComputerEngineeringDepartmentfortheir valuablehelp.

It is with humble gratitude & sense of indebtedness, we thankmyrespected andesteemed PrincipalDr. B. M. Patil for hisvaluable guidance, suggestion and constant support which lead towards successful completion of this work.

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