**Mergano Warehouse System**

**Summary Report**



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**Preface**

Mergano warehouse ® is software that migrates from issue in real tasks which encounter from trouble-free use, low efficiency and lack of security. This software has designed to fit in any type business, including fresh food warehouse, goods warehouse or distribution warehouse. Which is solution for the business that looking to streamline and effectively result in workflow.   
  
To aim this objective, we have focused to key features of warehouse business to make sure that the software will not impact to an internal operation. We have also prioritized the future to meet the requirement that makes your business works seamlessly.

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**Chapter 1 Getting start**

* 1. **Introduction**

From quality control, shipping and receiving, to order fulfillment and delivery to the customer, a **Mergano Warehouse ®** is vital to improving the efficiency of a company's warehouse operations. We offer warehouse management software packages that can be customized to fill the requirements of companies of any size. By combining a warehouse management system with an online database, barcode support, ID identification (RFID) support, and product quality control. Barcode support can help fully extend your enterprise to the mobile worker, while increasing operational efficiencies and enhancing your customer service.

**1.2 Problem description**

In many company the stock management has become the major core of business. From growing up in online ecommerce the stock management has the same priority as customer service. To deal with products in stock, this software will provide the solution to help anyone to manage the stock easily. By reducing the unnecessary mesh and complex interface. Because in most traditional warehouse software it has difficult ease of use, expensive and incompatibility in modern OS. Also some software has inaccurate stock control and insecure connection which can ruin your business workflow. This software will help your company to manage the stock which can deployed in any platforms.

* 1. **Security**

As organizations worldwide increase their reliance on software controls to protect their computing environments and data, the topic of Software Security Assurance grows in importance. The tremendous potential costs associated with security incidents, the emergence of increasingly complex regulations, and the continued operational costs associated with staying up to date with security patches all require that organizations give careful consideration to how they address software security.

**Mergano Warehouse ® Security Assurance**

Encompassing every phase of the product development lifecycle, Oracle Software Security Assurance (OSSA) is Oracle's methodology for building security into the design, build, testing, and maintenance of its products. Oracle's goal is to ensure that Oracle's products, as well as the customer systems that leverage those products, remain as secure as possible.

Mergano Warehouse ® Security Assurance is a set of industry-leading standards, technologies, and practices aimed at:

**Fostering security innovations.** Mergano Warehouse ® has a long tradition of security innovations. Today this legacy continues with market leading database security and identity management solutions.

**Reducing the incidence of security weaknesses in products.** Mergano Warehouse ® Security Assurance key programs include Secure Coding Standards, mandatory security training for development, the cultivation of security leaders within development groups, and the use of automated analysis and testing tools.

**Reducing the impact of security weaknesses in released products on customers.** Mergano Warehouse ® has adopted transparent security vulnerability disclosure and remediation policies. The company is committed to treating ALL customers equally, and delivering the best possible security patching experience through the Critical Patch Update and Security Alert programs.

**What is software security assurance?**

Software Security Assurance (SSA) is the process of ensuring that software is designed to operate at a level of security that is consistent with the potential harm that could result from the loss, inaccuracy, alteration, unavailability, or misuse of the data and resources that it uses, controls, and protects.

The software security assurance process begins by identifying and categorizing the information that is to be contained in, or used by, the software. The information should be categorized according to its sensitivity. For example, in the lowest category, the impact of a security violation is minimal (i.e. the impact on the software owner's mission, functions, or reputation is negligible). For a top category, however, the impact may pose a threat to human life; may have an irreparable impact on software owner's missions, functions, image, or reputation; or may result in the loss of significant assets or resources.

Once the information is categorized, security requirements can be developed. The security requirements should address access control, including network access and physical access; data management and data access; environmental controls (power, air conditioning, etc.) and off-line storage; human resource security; and audit trails and usage records.

**1.4 License agreement**

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* 1. **Life cycle support**

*Mergano warehouse® come with fully free support for first 3 months. This including online support, onsite-service support, software maintenance, database maintenance, data recover\* and others.*

*For software life cycle Mergano warehouse® can divide into 2 support stages.*

**The first stage** is mainstream stage which support up to 4 years including security update, bugs fixed, online services, core features and software compatibility.

**The second stage** is extended stage which support up to 1 year including security update only.

**Mainstream**

**Extended**

**Support stage comparison**

|  |  |  |
| --- | --- | --- |
| **Support list** | **Mainstream** | **Extended** |
| Security update | **x** | **x** |
| Software vulnerabilities | **x** | **x** |
| Bugs fixed | **x** |  |
| Online services | **x** |  |
| Core feature support | **x** |  |
| Software compatibility | **x** |  |
| Policy update | **x** |  |
| Extensions upgrade | **x** |  |
| [On-site](https://en.wikipedia.org/wiki/Secure_attention_key) services | **x** |  |

* 1. **System Requirement**

**Hardware requirements for Mergano Warehouse ®**

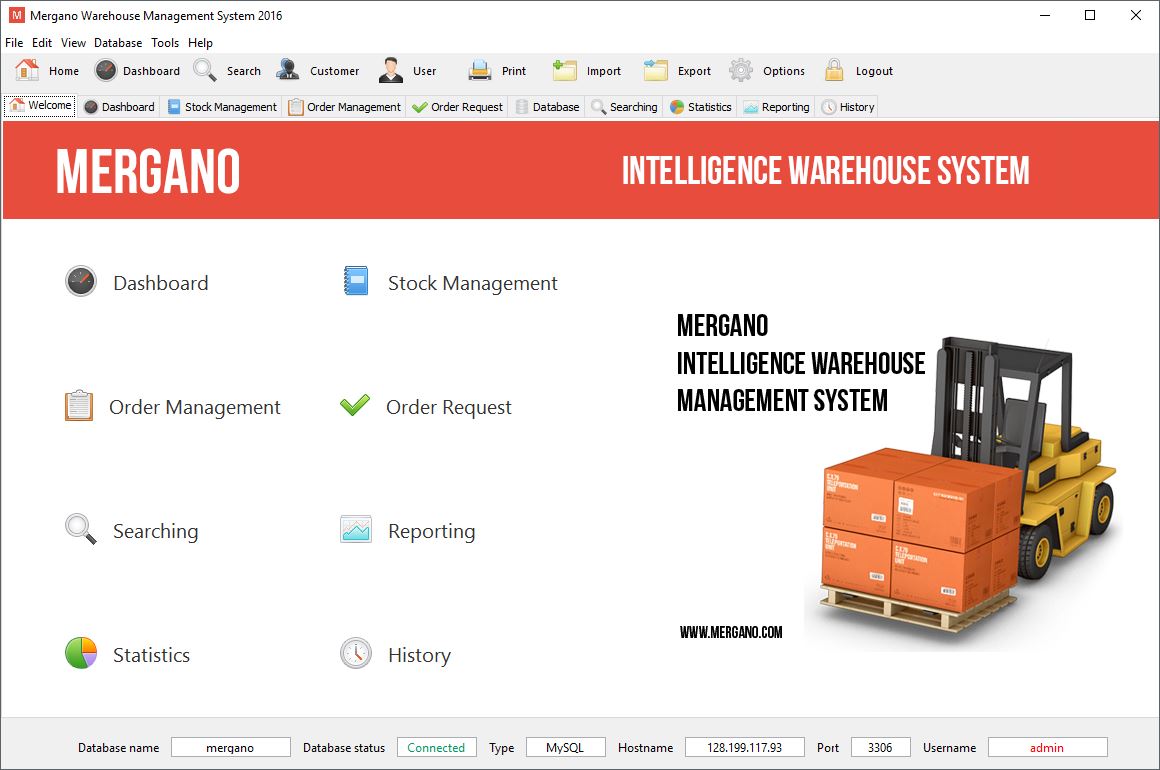
|  |  |  |
| --- | --- | --- |
| **Component** | **Minimum** | **Recommended** |
| [**Processor**](https://en.wikipedia.org/wiki/Central_processing_unit) | 1 [GHz](https://en.wikipedia.org/wiki/Gigahertz) [clock rate](https://en.wikipedia.org/wiki/Clock_rate) [IA-32](https://en.wikipedia.org/wiki/IA-32) or [x86-64](https://en.wikipedia.org/wiki/X86-64) architecture Support for [PAE](https://en.wikipedia.org/wiki/Physical_Address_Extension), [NX](https://en.wikipedia.org/wiki/NX_bit) and[SSE2](https://en.wikipedia.org/wiki/SSE2) | [x86-64](https://en.wikipedia.org/wiki/X86-64) architecture with support for[CMPXCHG16B](https://en.wikipedia.org/wiki/Compare-and-swap#Extensions), [PrefetchW](https://en.wikipedia.org/wiki/3DNow!) and LAHF/SAHF [CPU instructions](https://en.wikipedia.org/wiki/Instruction_set) |
| [**Memory (RAM)**](https://en.wikipedia.org/wiki/Random-access_memory) | **IA-32 edition:** 1 [GB](https://en.wikipedia.org/wiki/Gigabyte) **x86-64 edition:** 2 [GB](https://en.wikipedia.org/wiki/Gigabyte) | 4 [GB](https://en.wikipedia.org/wiki/Gigabyte) |
| [**Graphics card**](https://en.wikipedia.org/wiki/Graphics_card) | [DirectX 9](https://en.wikipedia.org/wiki/DirectX_9) graphics device [WDDM](https://en.wikipedia.org/wiki/Windows_Display_Driver_Model) 1.0 or higher driver | WDDM 1.3 or higher driver |
| [**Display**](https://en.wikipedia.org/wiki/Computer_monitor) | 800×600 [pixels](https://en.wikipedia.org/wiki/Pixel) | N/A |
| **Input device** | [Keyboard](https://en.wikipedia.org/wiki/Computer_keyboard) and [mouse](https://en.wikipedia.org/wiki/Mouse_(computing)) | [Multi-touch](https://en.wikipedia.org/wiki/Multi-touch) display |
| **Storage space** | **IA-32 edition:** 16 [GB](https://en.wikipedia.org/wiki/Gigabyte) **x86-64 edition:** 20 [GB](https://en.wikipedia.org/wiki/Gigabyte) | 40 GB or more |

**Additional requirements for optional functionality**

|  |  |
| --- | --- |
| **Feature** | **Requirements** |
| Barcode support | Barcode reader with support EAN13 and UPC-A |
| [Touchscreen](https://en.wikipedia.org/wiki/Secure_Boot) | Multi-touchscreen monitor |
| Cloud backup | Mergano cloud service [subscription](https://en.wikipedia.org/wiki/Trusted_Platform_Module) |
| Biometric authentication | Fingerprint reader |
| Device encryption | [Instant Go](https://en.wikipedia.org/wiki/InstantGo) |
| [Miracast](https://en.wikipedia.org/wiki/Miracast) | Wi-Fi adapter that supports Wi-Fi Direct |
| [Secure attention](https://en.wikipedia.org/wiki/Secure_attention_key) | Hardware equivalent of Ctrl+Alt+Delete key sequence |

**Mergano warehouse® required Java version 8 or higher to run.**

**1.7 Overview**



**4 Main sections of Mergano Warehouse ®**

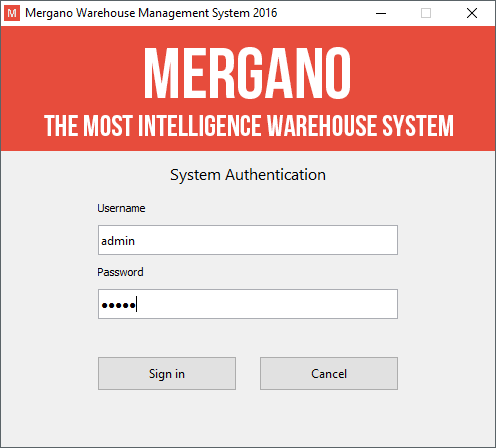
**File menu bar –** Including import, export data, print, configure database, search, backup, manage user, help support, update software, options and change languages.

**Main toolbar –** Display the common functions including home, dashboard, search, customer manager, user manager, print, import data, export data, options, logout

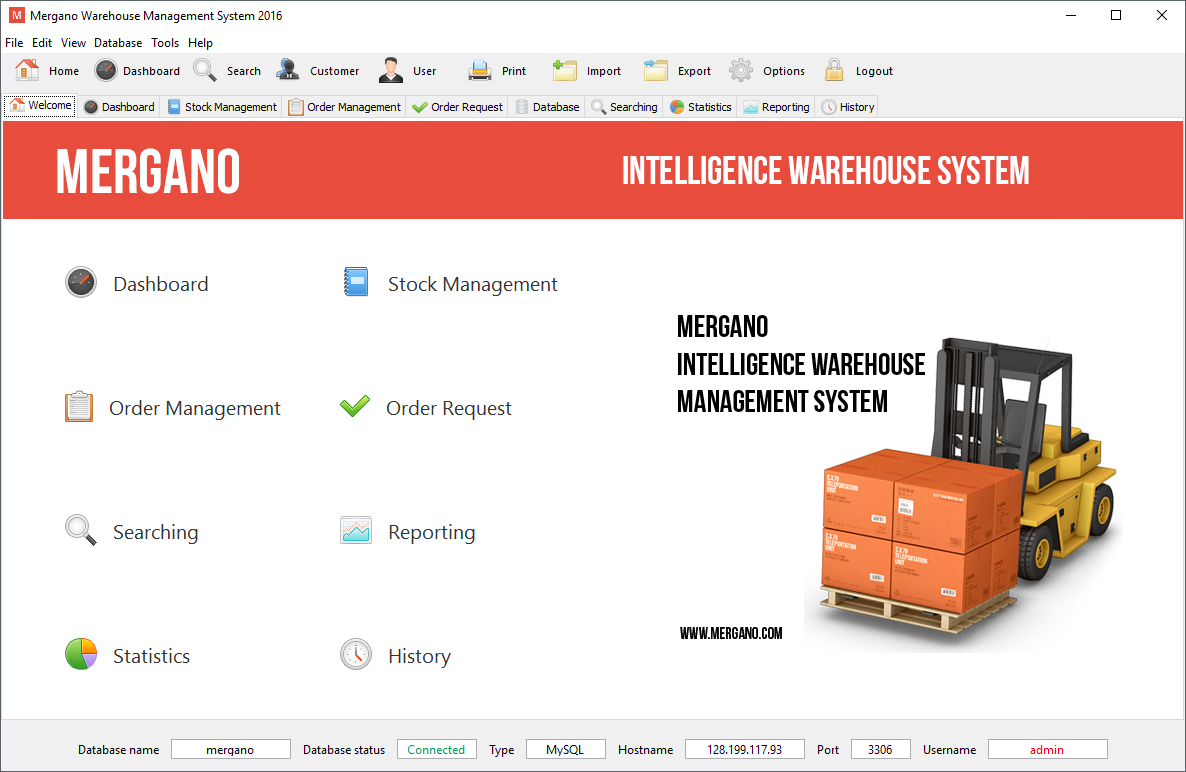
**Main menu –** Display the main functions of software including dashboard, stock management, order management, order request, searching, reporting, statistics and history.

**Status bar –** Show the current status of connection including database name, database status, type of database, hostname, port number and username that login.

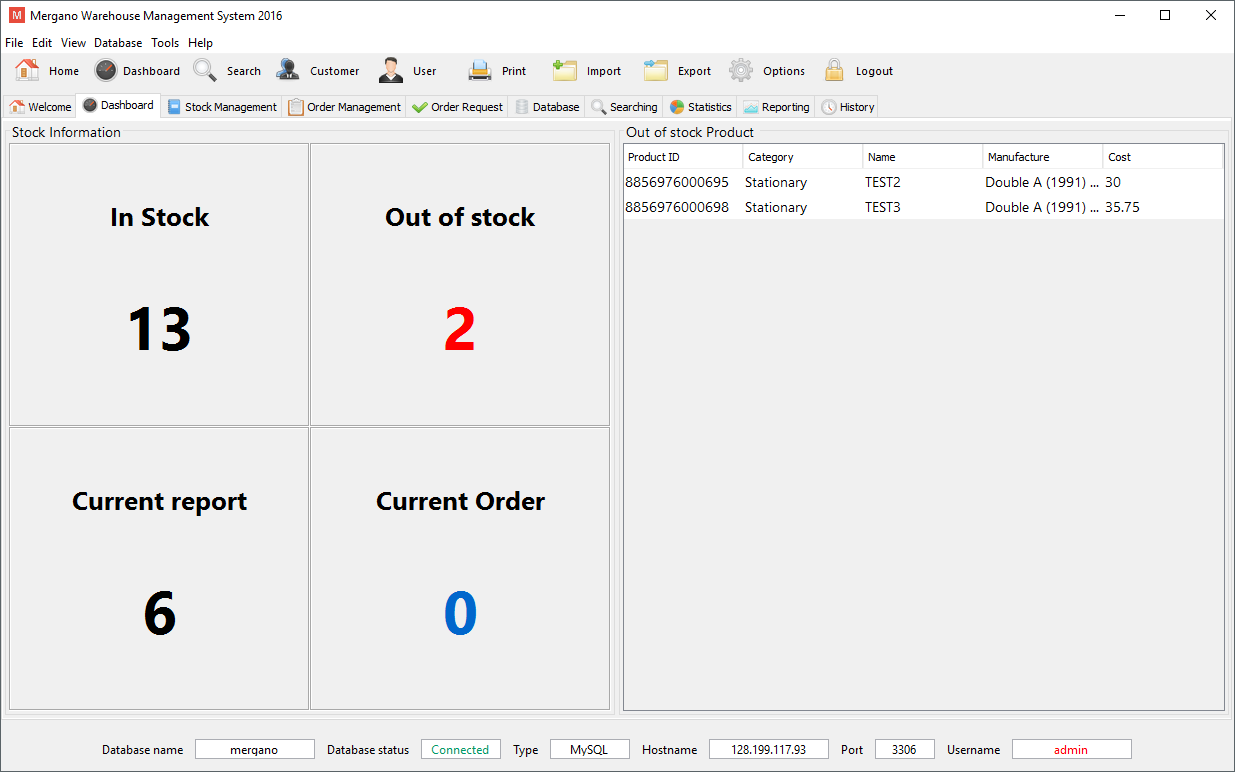
Login Authentication Dialog



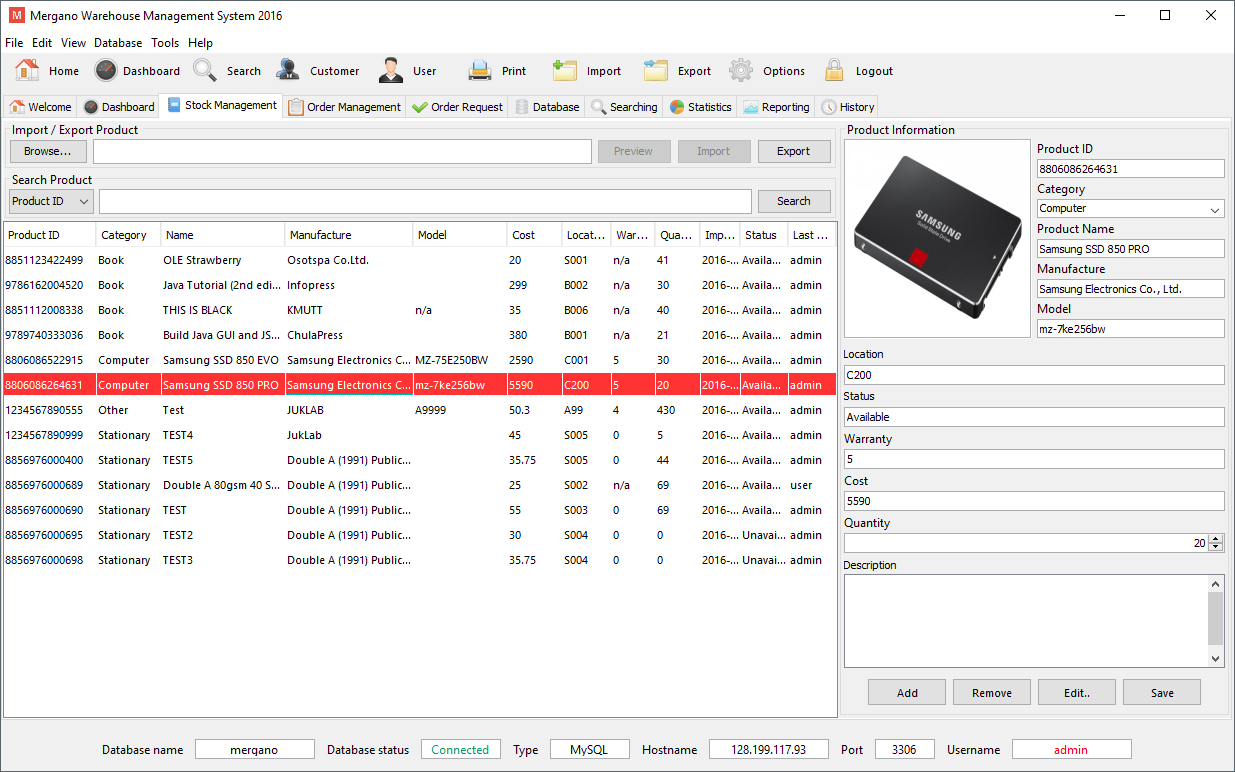
Welcome screen



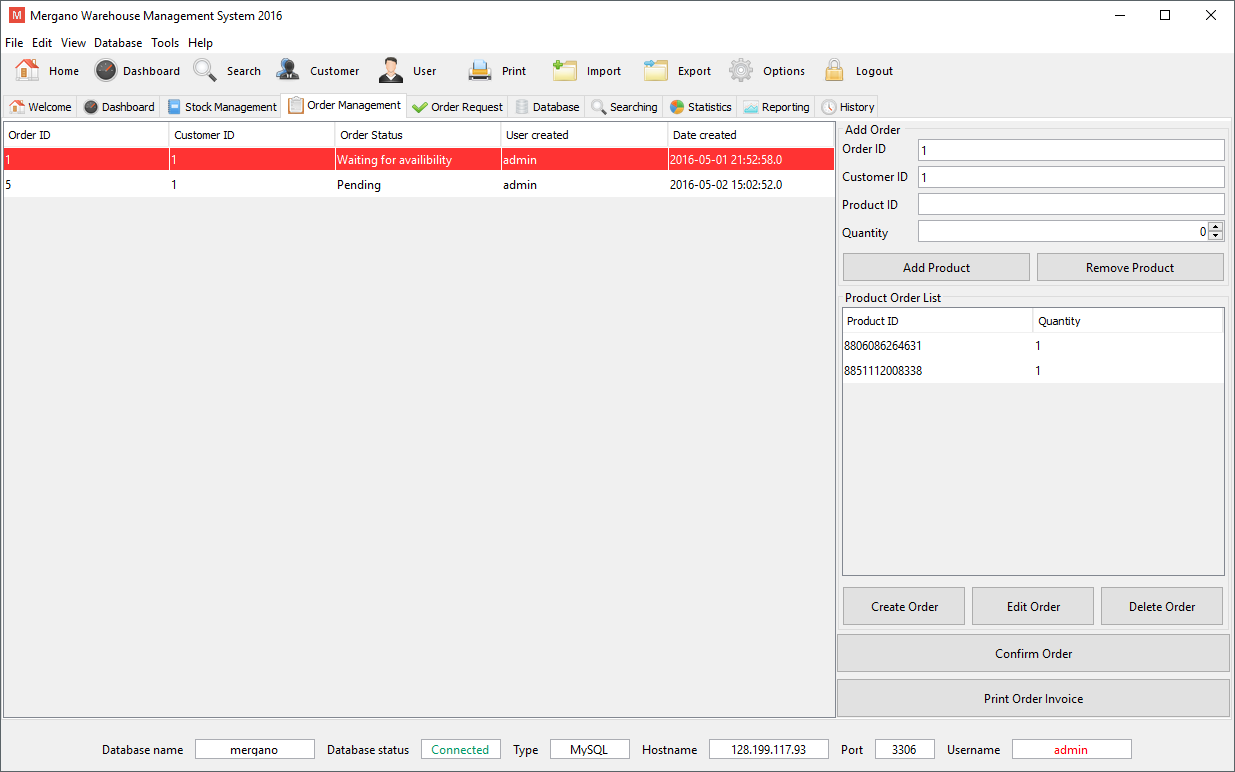
Dashboard screen



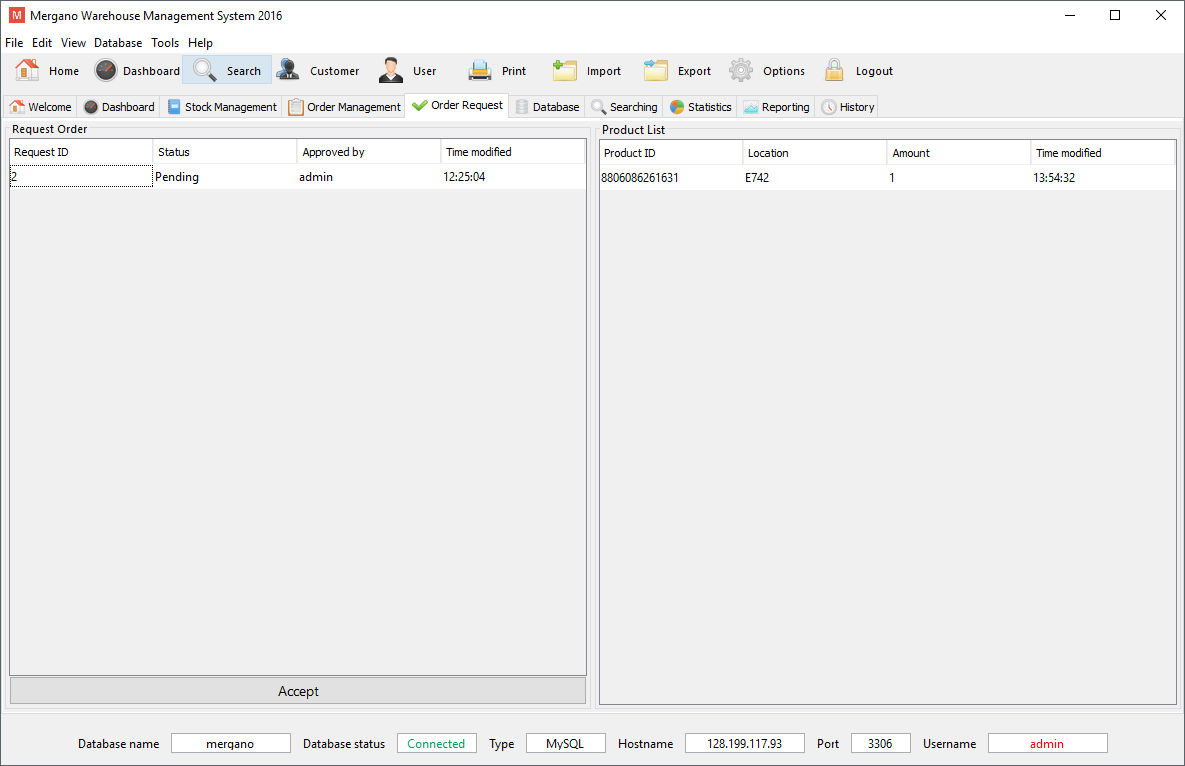
Stock Management screen



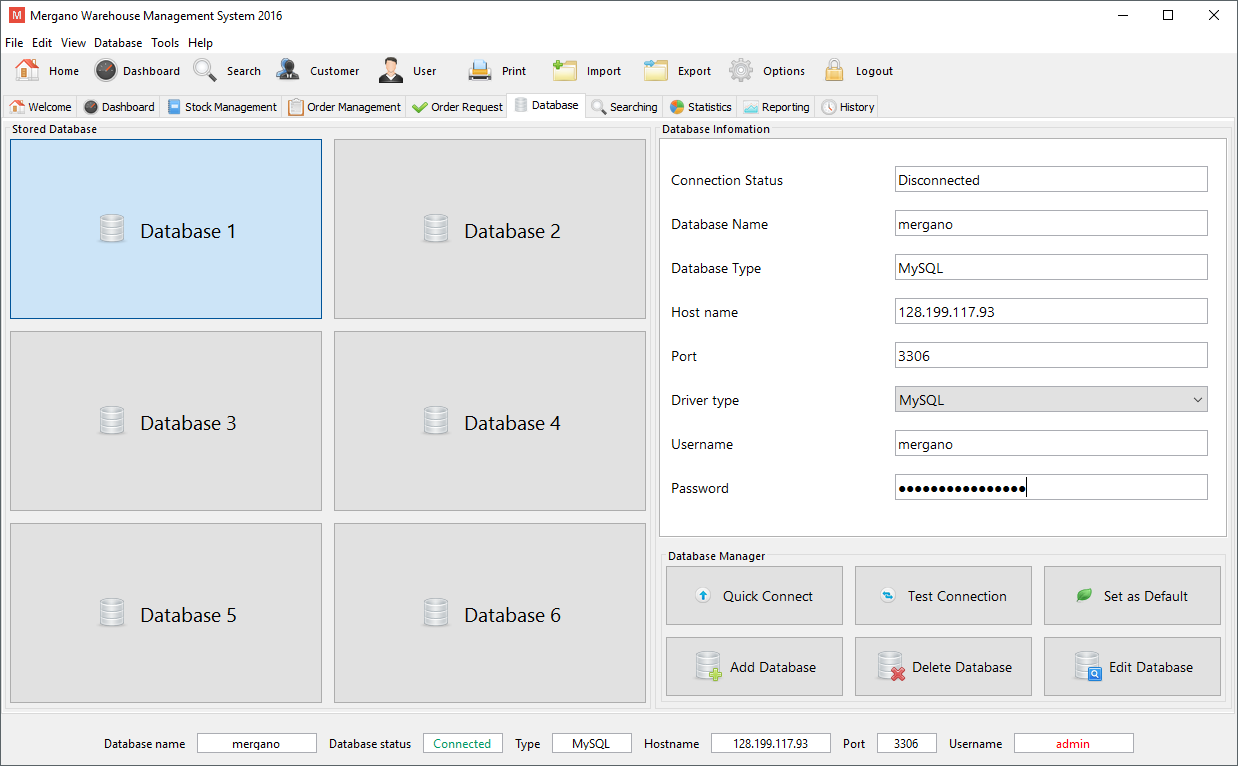
Order Management screen



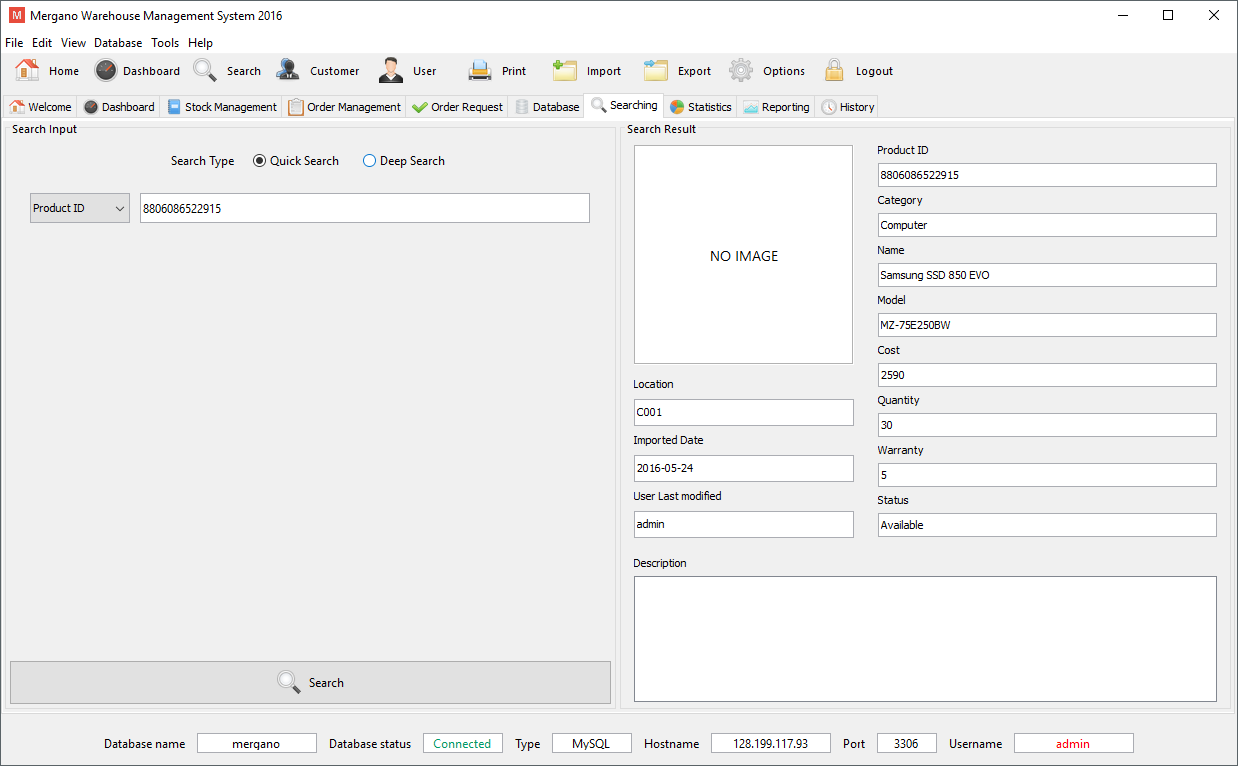
Order Request screen



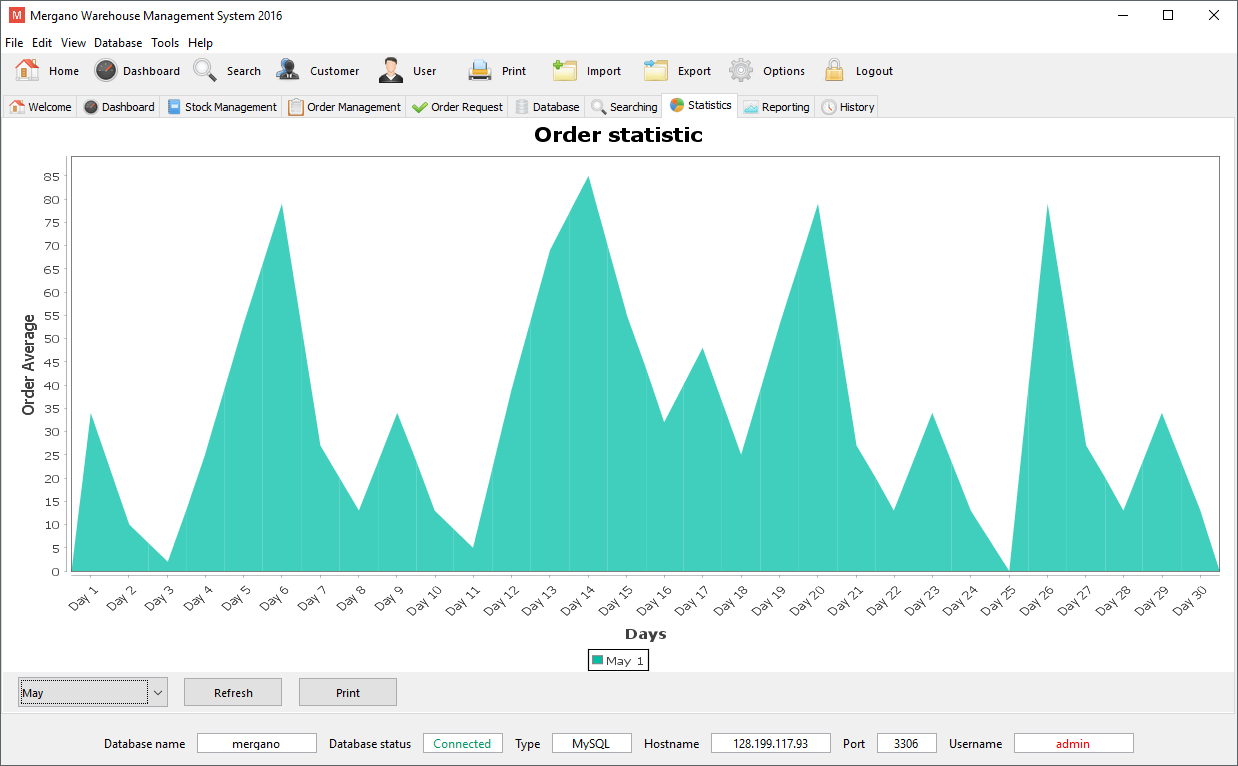
Database screen



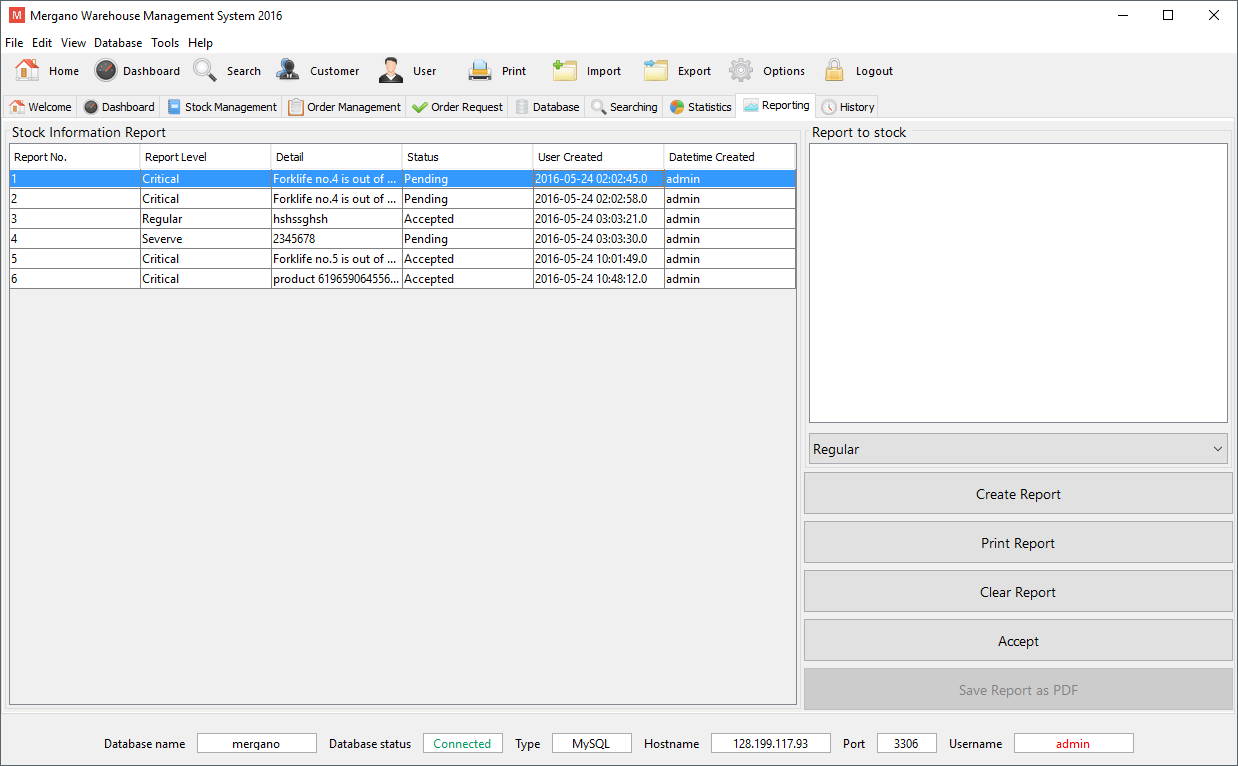
Search screen



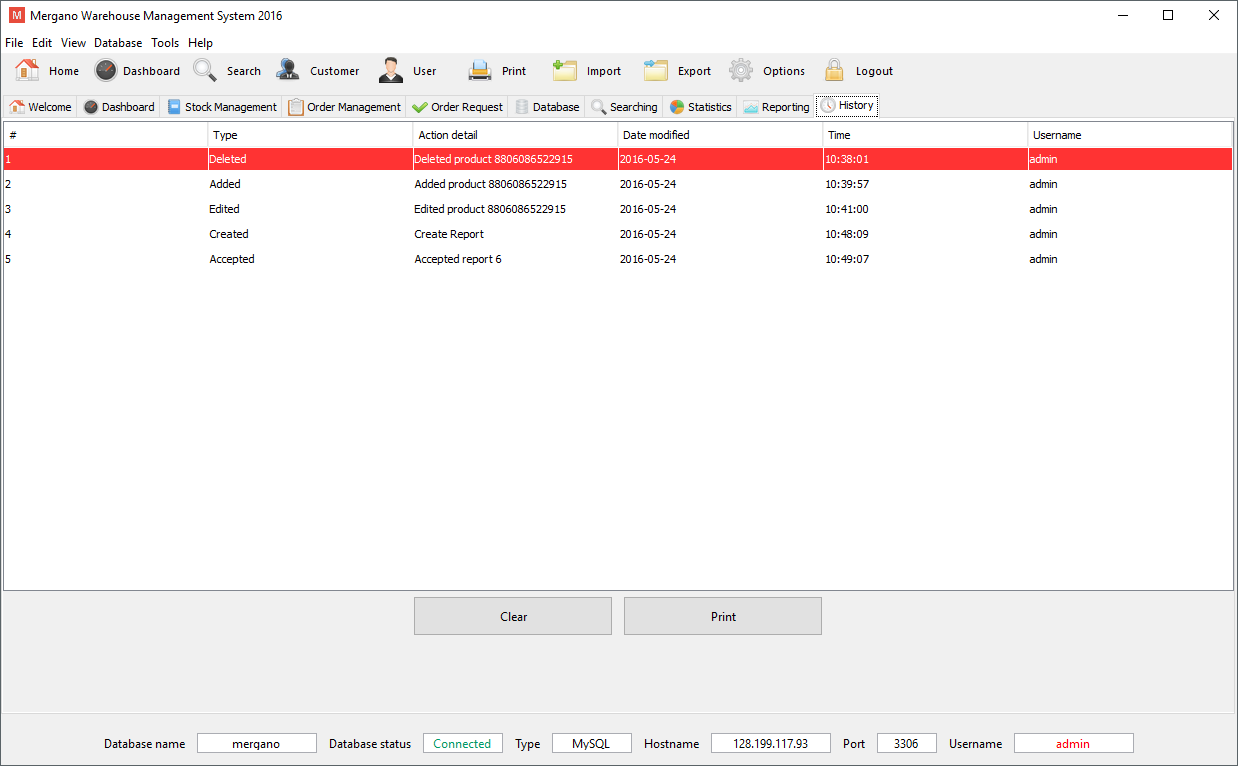
Order statistic screen



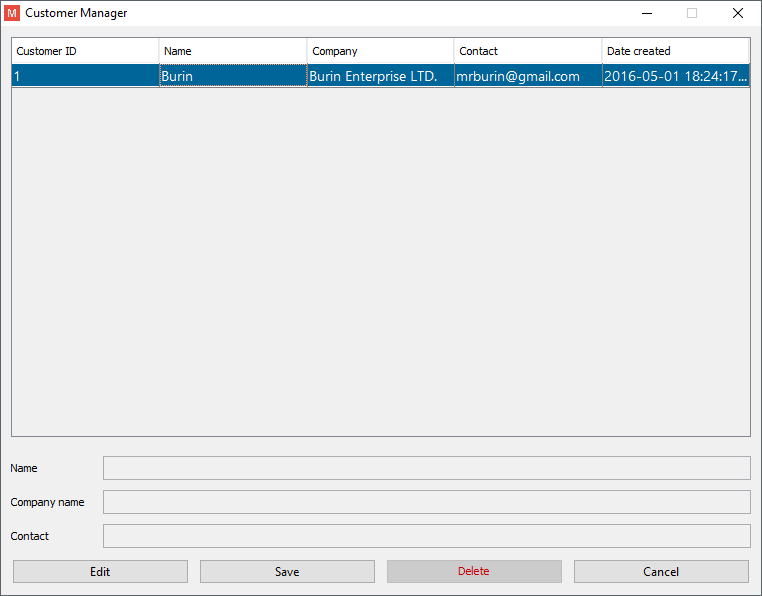
Warehouse Reporting screen



History screen



Customer Manager screen



**1.8 Preparation**

First check that your target computer meets all requirements in 1.6 before continue in installation process. This software need Java runtime to run the program.



If your computer does’t have Java® runtime, please visit <https://java.com/en/download/> and following their instructions.  
  
Next, verify that Java runtime is working properly on your computer and then follow the next step to continue installation process.

* 1. **Installation**

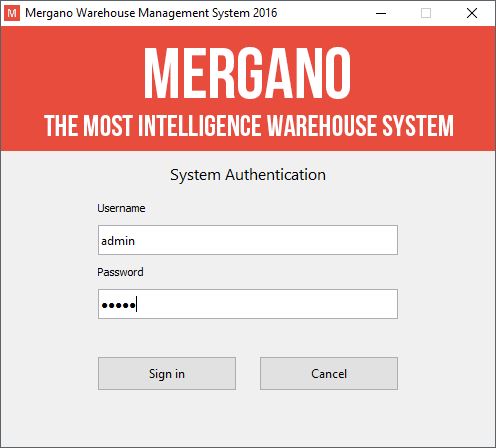
For installation it

**Chapter 2 Initialize the warehouse**

**2.1 Login into the software**

To login access to the Mergano warehouse® for the first time default username “admin” and default password is “admin”. Don’t forget to change the default password for your security.

If you forgot your username or password, please contact the Mergano support team or your administrator to reset your account.



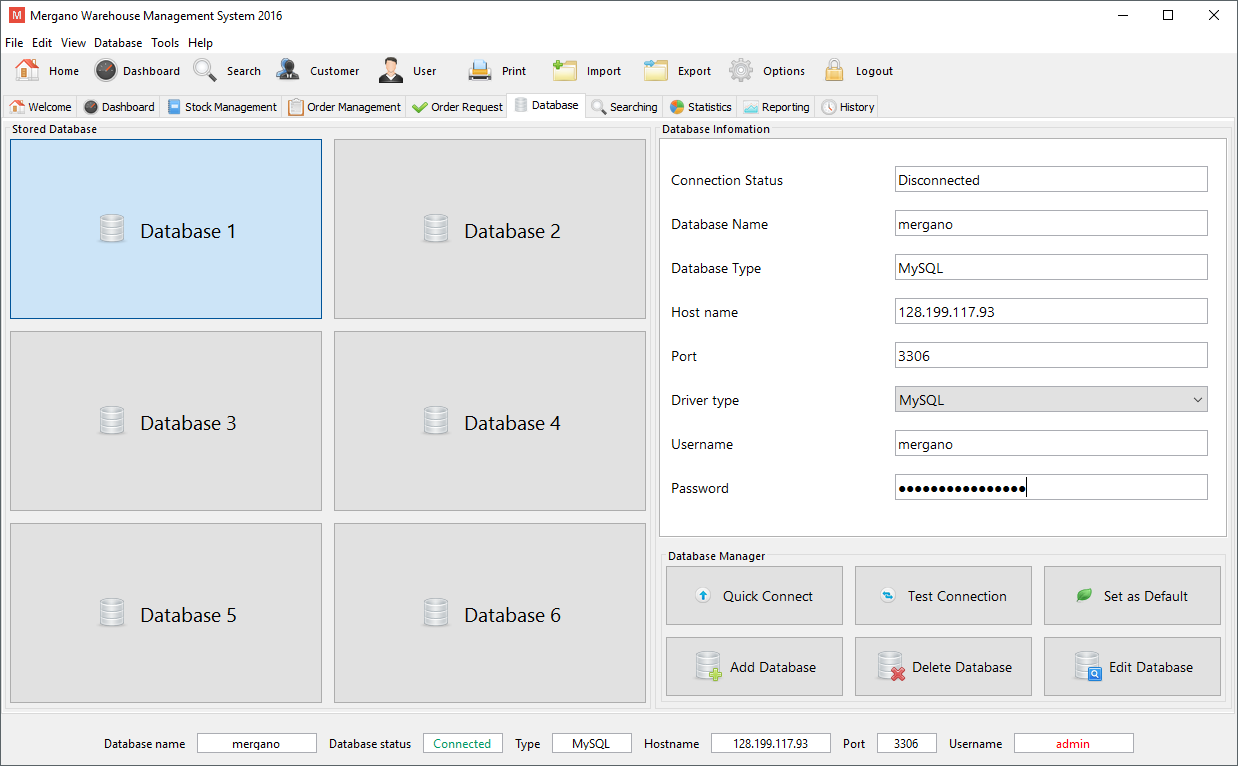
**2.2 Configure the connection**

2.2.1 To connect to your stock database, go to database page then select “Database 1” as default database.

2.2.2 Then fill in the database information after that click “Test Connection”.

2.2.3 To perform connection test. If successes click “Quick Connect” to connect to your database.

2.2.4 If you want set this database as default when start click “Set as Default”



**2.3 Start the service**

**2.4 Create the database**

**2.5 Create the user**

**2.6 Change password the user**

**2.7 Remove the user**

**Chapter 3 Product management**

**3.1 Add product  
3.2 Import product from CSV  
3.3 Import product from other database  
3.4 Edit product  
3.5 Remove product  
3.6 Export product to CSV  
3.7 Export product to PDF  
3.8 Clear product stock**

**Chapter 4 Order management**

**4.1 Add order  
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**Chapter 7 History**

**7.1 View history  
7.2 Save history  
7.3 Print/ Export history**

**Chapter 9 Troubleshooting**

**9.1 Commons error and causes**

**9.2 Deals with error code**

**9.3 Error code 1-30 Internal error**

**9.4 Error code 31-40 External error**

**9.5 Error code 41-60 Database error**

**9.6 Error code 61-70 Unknown error**

**Chapter 10 Design documentation**

**10.1 Software Requirement**

**Functional requirement**

- Display detail of product in stock including price, amount, warranty, date import.

- Real time notification when product out of stock or nearly expired.

- Automatic sync data which can add, or remove them in real time.

- Barcode supporting which help the employee to deal with products in stock.

- Stock reporting which summary the stock ordering and sale revenue.

- Backlog show the history of action and user that interact with stock.

**Nonfunctional requirement**

- Security: Encrypted your storage data and protect your from unauthorized users.

- Performance : Application can works on most computers with quick response time.

- Reliability: Automatic online backup to cloud service system.

- Ease of use: Design best for user experience with friendly user interface.

- Support: Compatible with any platforms, with online customer support.

**10.2 Software scope**

The Mergano Warehouse ® system is a software system designed to assist any users to maintaining stock in a variety of conditions and situations.

More specifically, this system provides automated stock control by attempting to maintain constant stock amount. Based on input from the user. This software is intended to partially stock control while allowing the user to override the system whenever they choose to do.

This system is designed to provide convenience to the user and help to improve business workflow while maintaining safe control over the motion of the vehicle.

**Feature Keys**

* Billing
* Category Customization
* Channel Management
* Demand Planning
* Inventory Management
* Manifesting
* Order Management
* Quality Control
* Shipping Management

**Note: 3PL** – A third-party logistics provider (TPL) is a firm that provides service to its customers of outsourced (or "Third Party") logistics services for part, or all of their supply chain management functions.

**10.3 Software structure**

The structure divide into 4 big sections are core, bean, Dao and gui.

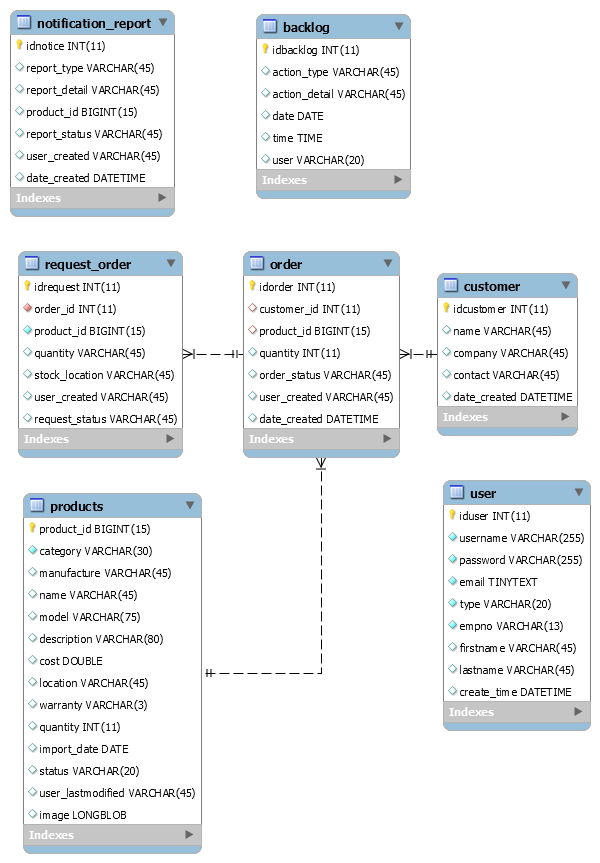
**Core** – package that combine all common functions in software including bean, Dao and other function class ex: connect DB

**Bean** – package that contain the bean blinder which do getter and setter in the role for storing data as object to prepare statement before insert, delete or update

**DAO** – data access object it’s package that contain the query method which get the query data from database

**GUI** – graphic user interface in this package contain all view class that contact with the user and display the output and get data input.

**10.4 Software activity diagram**

**10.5 Software entity-relationship diagram  
**

**10.6 Software use case diagram**

**10.7 Software data flow diagram**

**Chapter 11 Software test result**

**11.1 Software test case**

|  |  |  |  |
| --- | --- | --- | --- |
| **Functionality Tested** | **Test result** | | **Cause(s)** |
| **Pass** | **Failed** |
| **Registration** | | | |
| Warning when user name already exists. | ✓ |  |  |
| Warning when a username password or email are not filled in. | ✓ |  |  |
| **Connection** | | | |
| Warning when internet is disconnected. | ✓ |  |  |
| Connected status is showing properly. | ✓ |  |  |
| **Authentication** | | | |
| Verify that the username and password are correct. | ✓ |  |  |
| Ban the user if exceed more than 5 times. | ✓ |  |  |
| **Dashboard** | | | |
| Stock monitor is working properly. | ✓ |  |  |
| Out of stock product table is  working properly. | ✓ |  |  |
| **Stock Management** | | | |
| Stock table is working properly. | ✓ |  |  |
| Quick search is working properly. | ✓ |  |  |
| Filter search show the required data. | ✓ |  |  |
| Product pictures are showing properly. | ✓ |  |  |
| Product details are showing properly. | ✓ |  |  |
| Add product process | ✓ |  |  |
| Edit product process | ✓ |  |  |
| Delete product process | ✓ |  |  |
| Change product image. | ✓ |  |  |
| Export table into CSV file. | ✓ |  |  |
| Import data from CSV file into table. | ✓ |  |  |
| Print product table is working properly. | ✓ |  |  |
| Menu popup add to order list is working. | ✓ |  |  |
| **Order Management** | | | |
| Order table is working properly. | ✓ |  |  |
| Add order process | ✓ |  |  |
| Delete order process | ✓ |  |  |
| Edit order process | ✓ |  |  |
| Confirm order process | ✓ |  |  |
| Add product to product list process. | ✓ |  |  |
| Send product list to order. | ✓ |  |  |
| View order history | ✓ |  |  |
| Remove product from product list. | ✓ |  |  |
| **User Management** | | | |
| Manage the user account. | ✓ |  |  |
| Change user password. | ✓ |  |  |
| Add, Edit, Update user account | ✓ |  |  |
| Change user type. | ✓ |  |  |
| User privilege level working properly. | ✓ |  |  |
| **Customer Management** | | | |
| Manage the customer account. | ✓ |  |  |
| Add customer process. | ✓ |  |  |
| Edit customer information. | ✓ |  |  |
| Delete customer process. | ✓ |  |  |
| Customer table is working properly. | ✓ |  |  |
| **Request Order Management** | | | |
| Request order table is showing properly. | ✓ |  |  |
| Request product is showing properly. | ✓ |  |  |
| User level accept request order correctly. | ✓ |  |  |
| **Database Management** | | | |
| Add database connection. | ✓ |  |  |
| Connect to custom database. | ✓ |  |  |
| Edit database connection | ✓ |  |  |
| Remove database connection. | ✓ |  |  |
| **Searching** | | | |
| Search by name is working properly. | ✓ |  |  |
| Search by product ID is working properly. | ✓ |  |  |
| Deep search mode is working. | ✓ |  |  |
| Quick search mode is working. | ✓ |  |  |
| Search data is showing correctly. | ✓ |  |  |
| **Reporting** | | | |
| Create report process. | ✓ |  |  |
| Print report is working properly. | ✓ |  |  |
| Clear report process | ✓ |  |  |
| Accept report process | ✓ |  |  |
| Save report as PDF is working properly. | ✓ |  |  |
| **Order Statistic** | | | |
| Area graph is showing properly. | ✓ |  |  |
| Month filter is working properly. |  | ✓ | Lack of order data. |
| Receive total order correctly. | ✓ |  |  |
| **History** | | | |
| History table is working properly. | ✓ |  |  |
| Clear table process. | ✓ |  |  |
| Print history table. | ✓ |  |  |
| **Other functional** | | | |
| Logout process | ✓ |  |  |
| Change interface language |  | ✓ | No language available. |

*\*Tested on 24 May 2016*

**11.2 Scenarios test case**

|  |  |
| --- | --- |
| **Scenarios Types** | **Test Result** |
| Slow internet speed | Work properly |
| High load usage | Work properly |
| Database down | Slow data access |
| Power failure | Based on UPS model |
| Service failed to start | Enter recovery mode |

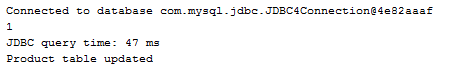
**11.3 Performance benchmark**

**Performance Test**

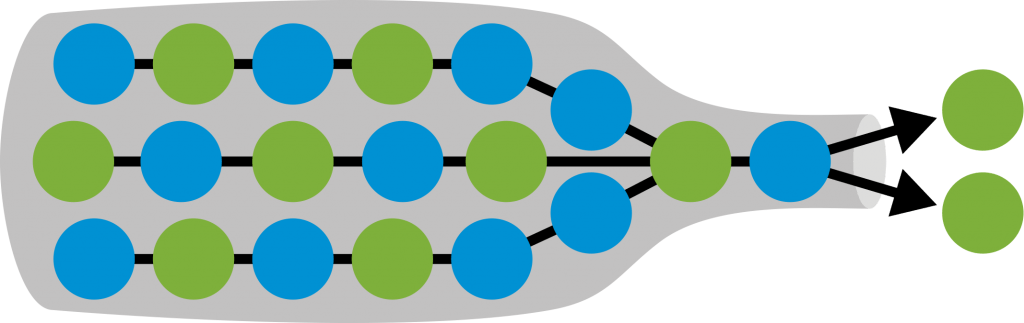


|  |  |
| --- | --- |
| **Speed benchmark test** | **Fetch / Load Time** |
| Load product table | 47ms |
| Load order table | 44ms |
| Load order request table | 45ms |
| Load out of stock product table | 37ms |
| Fetch statistic graph | 25ms |
| Load report table | 27ms |
| Load history table | 27ms |

*\*Tested on 24 May 2016*

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**Bottleneck Test**

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|  |  |
| --- | --- |
| **Bottleneck test** | **Fetch / Load Time** |
| Import 20 products | 48ms |
| Import 40 products | 67ms |
| Import 80 products | 70ms |
| Import 160 products | 94ms |
| Import 320 products | 172ms |

*\*Tested on 24 May 2016*



**Chapter 12 Feedback result**

**12.1 Business acceptance feedback**

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Stock management system: Mergano Warehouse® reflection feedback on May 27, 2016.

This is reflection from manager of Print Express Ltd., on May 27, 2016 at Seacon Square Department Store (Branch no.2) B1 floor. This business decided to used our software to replace an old stock software which lack of performance and low ease of use. So we have adapted our software to run the software trial for a week.

After trial session ended we have both feedback sides. For positive side, this software has fully functional requirement this provide much more convenient to manage product and spares in stock. This software make stock managing easier to manage many spares which reduce time to search specific product. For negative side, some layouts are difficult to use at the first time so it’s might take a time when getting start but overall it’s worth to deploy it.

**Mr. Keerawat Visitsaktavorn**Vice President

**12.2 Team contribution reflection**

**Mr. Sirawat Ngarmphandisorn**Project Lead Manager

**Feedback Result:** In my opinion this project makes me understand the problem of each member and how them participate. This help me to improve the management skills to lead the project in the right way and on time.

**Mr. Suphakon Kongsumran**Developer and Business Research

**Feedback Result:** Every software has their own pattern. I’ve learn from this project by designing the process to see how the process did. I’ve take the research from other software to learn how it work and what they are missing.

**Mr. Chukkrit Visitsaktavorn**Developer and Database administrator

**Feedback Result:** I’ve learn a lot since the beginning of business warehouse process, how it works? Which make me understand how the business work and what their obstacles in the process. This make me how to view as business person and learn to plan and design the solution to fit their workflow.

**Mr. Thammaseth Dangboonruang**Software Designer and Documentation

**Feedback Result:** I discovered that even the simplest things on earth could be turned into something amazing if we put enough creativity and effort into working on them. I learned that every design has its weaknesses and strengths and working with a group can help discover what they are.

**Mr.** **Chatchapol Kongmat**Software Quality Assurance

**Feedback Result:** Good software shouldn’t have any bugs. I’ve learn that quality of software it’s not only come from software design but also come from the good functional with no bug which make the software work perfectly.

**Mr. Wicheya Teekarungruang**Business Outlook Research

**Feedback Result:** I think most developer should analysis from many business views and comments. To be sure that our solution is right for that business. This project helps me to learn how to think in business workflow.

**Mr. Mathias Wahlqvist**User Experience Designer

**Feedback Result:** This project helps out me to view as user by exploring the user experience of each business. Also the project must come with the great response.

**Summary Feedback from Project Lead Manager:**

This is summary reflection from our team, First, the most obvious thing that I discovered was the advantage of working as part of a group I learned that good teamwork is the key to success in design activities when time and resources are limited. As everyone had their own point of view, many different ideas could be produced and I found the energy of group participation made me feel more energetic about contributing something.

**Feedback Improve:**

* Occasionally arrives late to work.
* Sometimes does not make sure all work is completed before leaving for the day.
* Required paperwork is completed late or is only partially complete.
* Spends too much time focusing on less important aspects of daily job.
* Needs to develop analytical skills necessary to weigh options and choose the best way to deal with situations.

**12.3 Future mission and our vision**

Mergano Warehouse® have aim more than the functional this software also design to support the future extension and implement new services. Our vision is to create the software that can cover the overall business which fit the size of in any type of SME and create the workflow result effective.

**12.4 About Team**

**Our developer team have divide into 7 sections by using Agile development approach.**

|  |  |  |
| --- | --- | --- |
| **Responsible person** | **Student ID** | **Name** |
| Project Lead Manager | 57130500220 | Mr. Sirawat Ngarmphandisorn |
| Developer and Business Research | 57130500221 | Mr. Suphakon Kongsumran |
| Developer and Database administrator | 57130500244 | Mr. Chukkrit Visitsaktavorn |
| Software Designer and Documentation | 57130500232 | Mr. Thammaseth Dangboonruang |
| Software Quality Assurance | 57130500228 | Mr. Chatchapol Kongmat |
| Business Outlook Research | 57130500255 | Mr. Wicheya Teekarungruang |
| User Experience Designer | 57130500262 | Mr. Mathias Wahlqvist |