

Introduction of ZWCS (ZimVie Warehouse Control System)

Outline

- I. Login and Main Menu Structure
- II. Each Function
 - a. Import Shipping Notice
 - b. Re-Print Product Labels
 - c. Synchronize Item Master with Kintone
 - d. Verify Product Labeling
- III. System Settings
 - e. Source Code Management
 - f. Application File Deployment
 - g. Database Server Setting

Outline

I. Login and Main Menu Structure

II. Each Function

- a. Import Shipping Notice
- b. Re-Print Product Labels
- c. Synchronize Item Master with Kintone
- d. Verify Product Labeling

III. System Settings

- e. Source Code Management
- f. Application File Deployment
- g. Database Server Setting

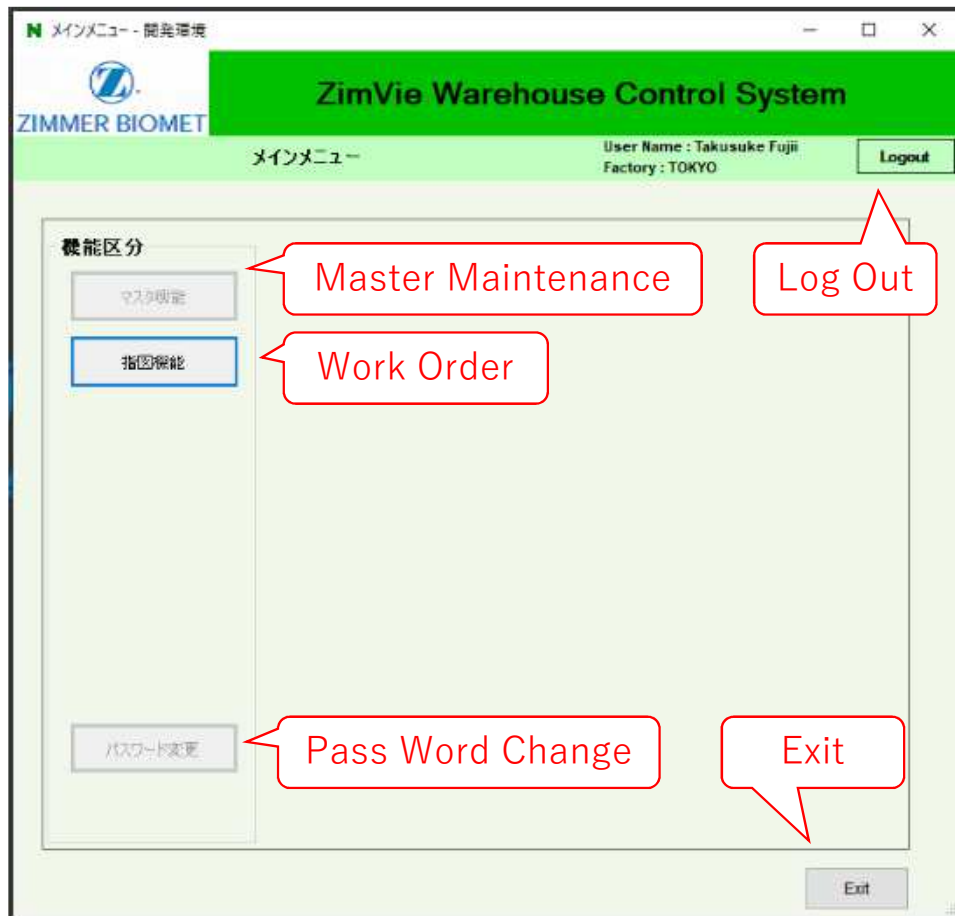
Login



The screenshot shows a login window titled "Login" with a close button (X) in the top right corner. The window features the Zimmer Biomet logo and the text "ZIMMER BIOMET" on the left. A green banner at the top right reads "ZimVie Warehouse Control System". Below the banner, there are two text input fields: "Login Name" containing the text "fujit" and "Password" containing a series of asterisks. Below these fields are two buttons: "Login" and "Cancel". At the bottom left, the text "VERSION : 1_0_0_00" is displayed.

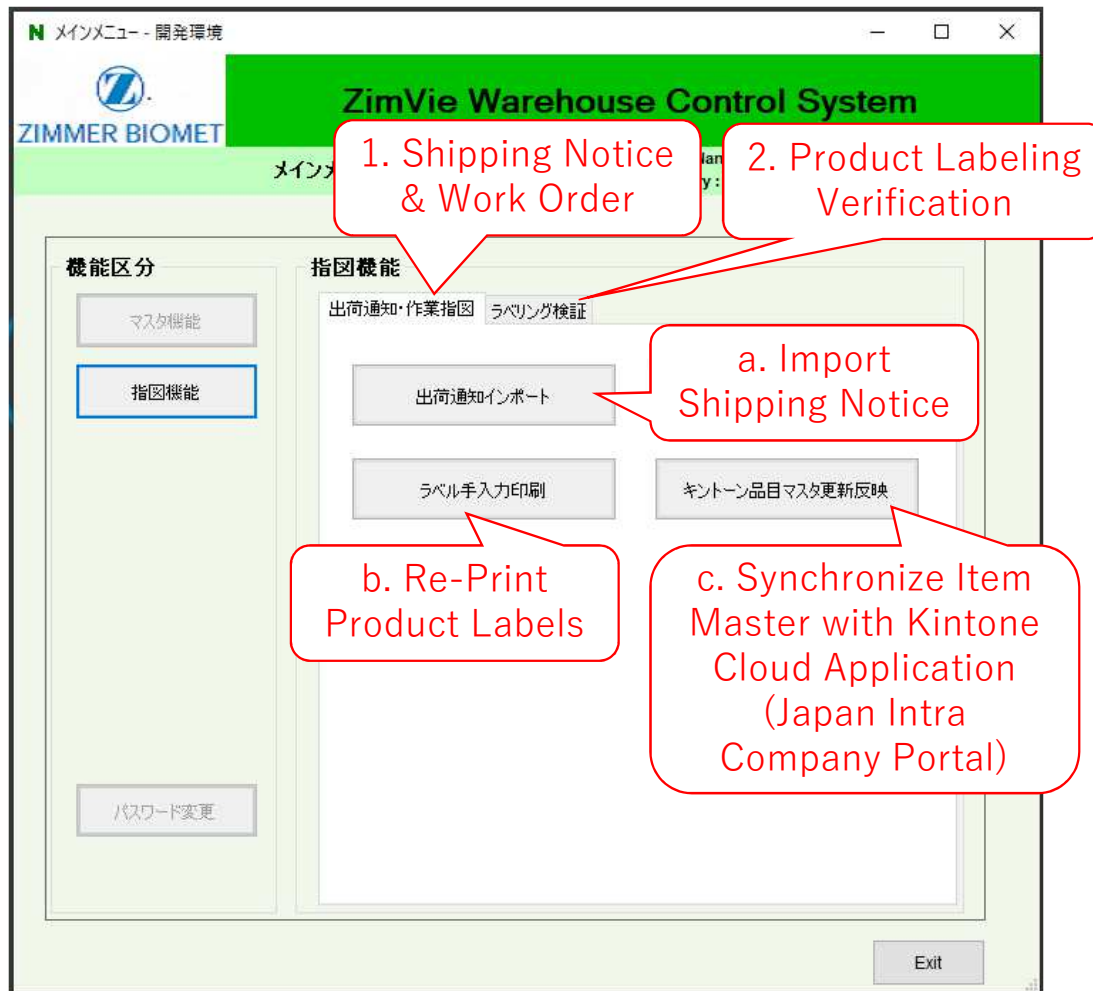
Even though user authentication and role & responsibility control functions are implemented, it is turned off to minimize the complexity in operation, considering that most of the users of this application are logistics partner employee. Currently, user can log in by typing any letters in user name text box and password text box.

Main Menu



Master maintenance menus such as user - role & responsibility masters are disabled, so is the password change menu. Currently, only the work order related menus are set as available.

Main Menu first tab: Shipping Notice & Work Order



Work order menu consists with 2 tabs:

1. Shipping Notice & Work Order
2. Product Labeling Verification

1. Shipping Notice & Work Order tab provides 3 functions:

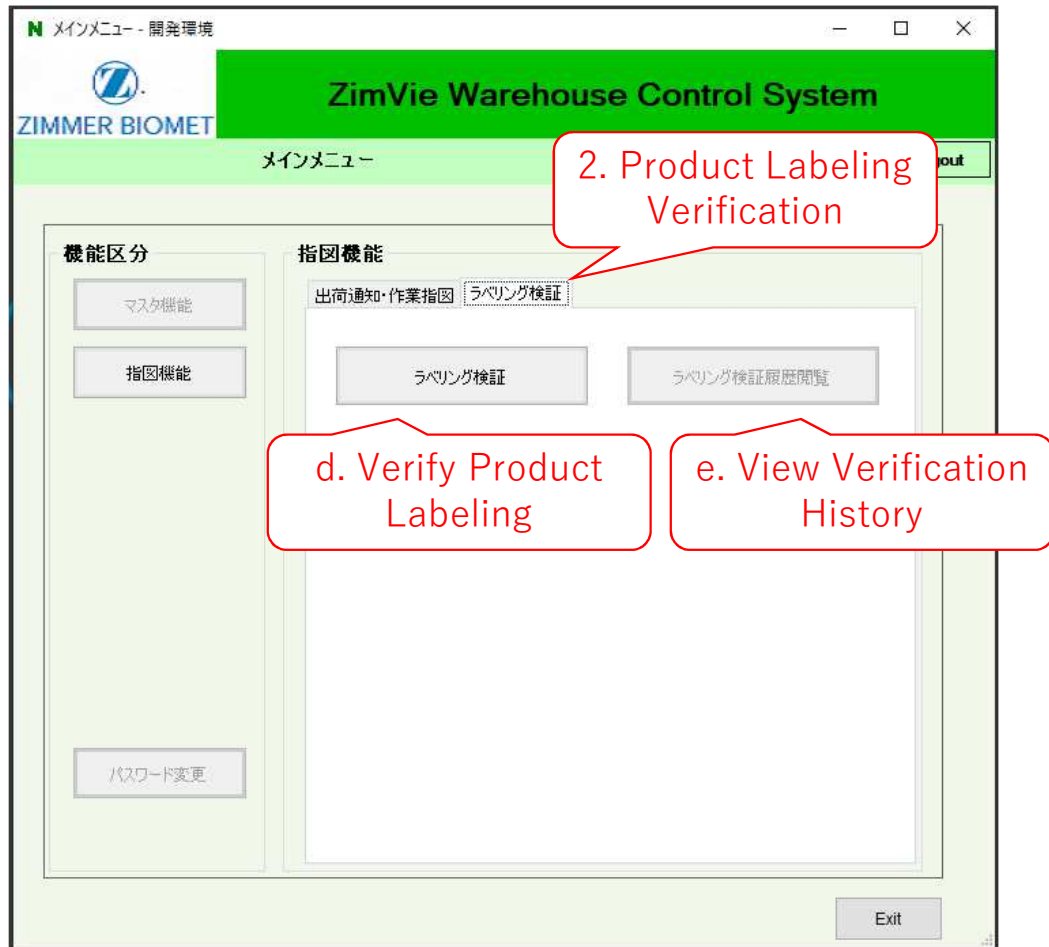
- a. Import Shipping Notice
- b. Re-Print Product Labels
- c. Synchronize Item Master

a. Import Shipping Notice does:
Convert shipping notice into work order and product label

b. Re-Print Product Labels does:
Let user manually print product label

c. Synchronize Item Master:
Synchronize local item master with Kintone item master

Main Menu second tab: Product Labeling Verification



Work order menu consists with 2 tabs:

1. Shipping Notice & Work Order
2. Product Labeling Verification

2. Product Labeling Verification tab provides 2 functions:

- d. Verify Product Labeling
- e. View Verification History

d. Verify Product Labeling does:
Convert shipping notice into work order and product label

e. View Verification History does:
Let user manually print product label

Outline

I. Login and Main Menu Structure

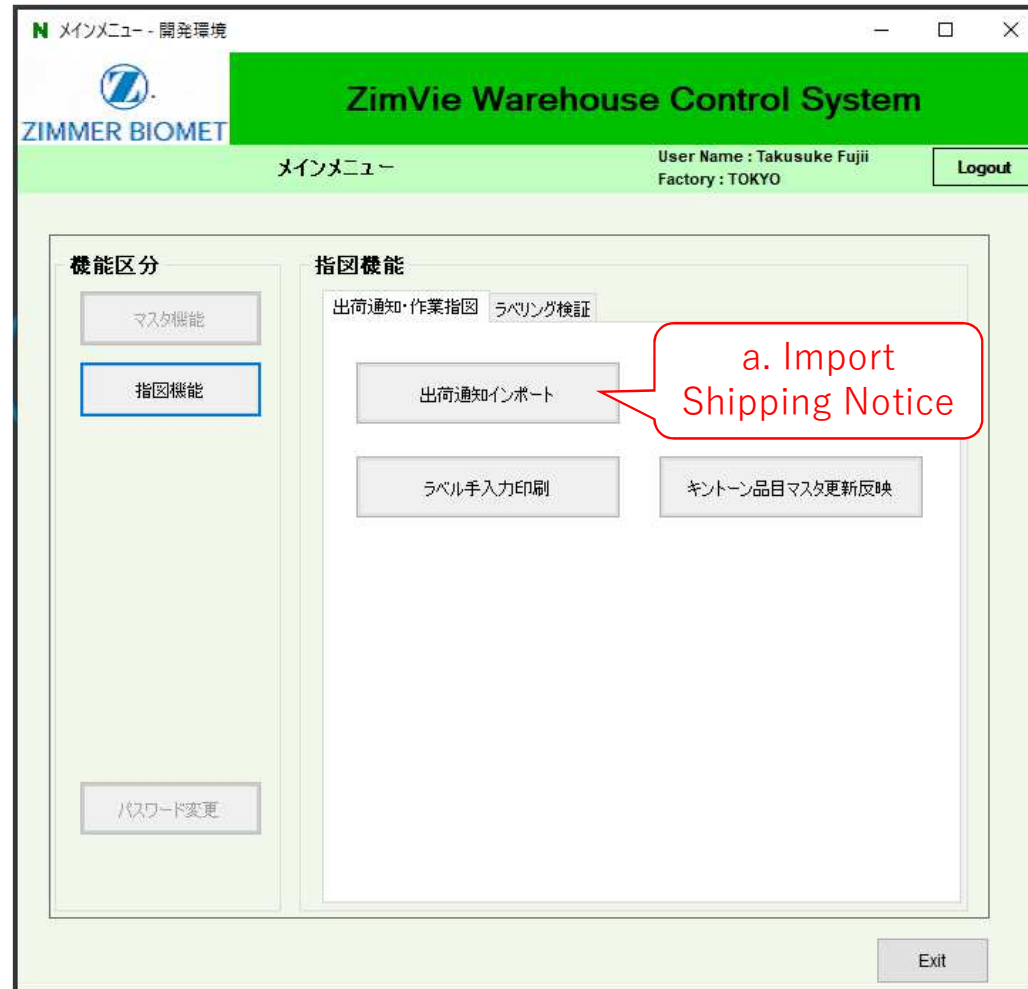
II. Each Function

- a. Import Shipping Notice
- b. Re-Print Product Labels
- c. Synchronize Item Master with Kintone
- d. Verify Product Labeling

III. System Settings

- e. Source Code Management
- f. Application File Deployment
- g. Database Server Setting

a. Import Shipping Notice



a. Import Shipping Notice

出荷通知取込と指図書発行

User Name : Takusuke Fujii Logout

仕入先: 000000: Zimmer Biomet USA (PBG) Select supplier

出荷通知番号: SN20220128A Input shipping notice number

出荷通知発行日: 2022/01/17 Select shipping notice date

発注番号	納品番号	品目番号	引当番号	引当数量	有効期限
90606	191919191	1993	20210930	100	2022/02/01

α. Import shipping notice excel file

β. Generate & print work orders, then print product labels for each order

出荷通知取込 指図書生成 閉じる

Import Shipping Notice Screen provide the below two functions:

α. Import shipping notice excel file then display its details.

β. Generate & print work orders, then print product labels.

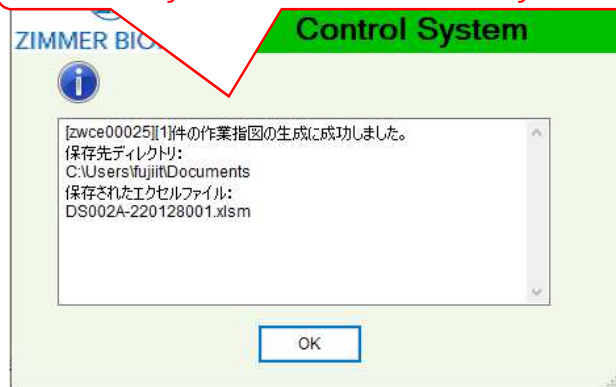
	A	B	C	D	E	F	G	H	I
1	Order Number	PO Number	Invoice Number	Item Number	Quantity Ordered	Shipped Quantity	Unit Sell Price	Lot Number	Lot Expiration date
2	987654321	50505	191919191	1993	100	100	16.42	20210930	01-Feb-2022
3									
4									

“Shipping notice” here refers to “COC: certificate of conformance” sent from PBG or the “ASN: advance shipping notice” sent from the 3rd party suppliers.

a. Import Shipping Notice

The result of clicking the button "β. Generate & print work orders, then print product labels"

Work order Excel file is generated in My Document directory.



Product labels are printed from barcode printer

受入検査・出荷判定記録

1. 作業指図

作業指図番号	DS002A-220128001	PO番号	50505
		REF番号	SN20220128A
販売名	スプライン ツイスト MP-1		
製品番号/ロット番号	検査記録に記載	指図明細件	

+ 使用資材

ラベル台紙管理番号	別紙参照	ラベル発行
添付文書管理番号	DS002A	添付文書枚
資材		別紙

+ 作業指示

外観検査、ラベル貼付、文書添付
ラベル貼付前に、商品箱を開け、商品ボディを換品

Work order papers are printed from ordinary document printer

出荷判定明細書

資材確認者: 最終検査者: 作業指図番号: DS002A-220128001 Page: 1/1

製品名	製品番号	ロット	使用期限	数量
スプライン ツイスト MP-1 0.5MM×8MM	1993	20210930	2022/2/1	100
外観検査: 適合数:	外観検査: 不適合数:	最終検査: 適合数:	最終検査: 不適合数:	

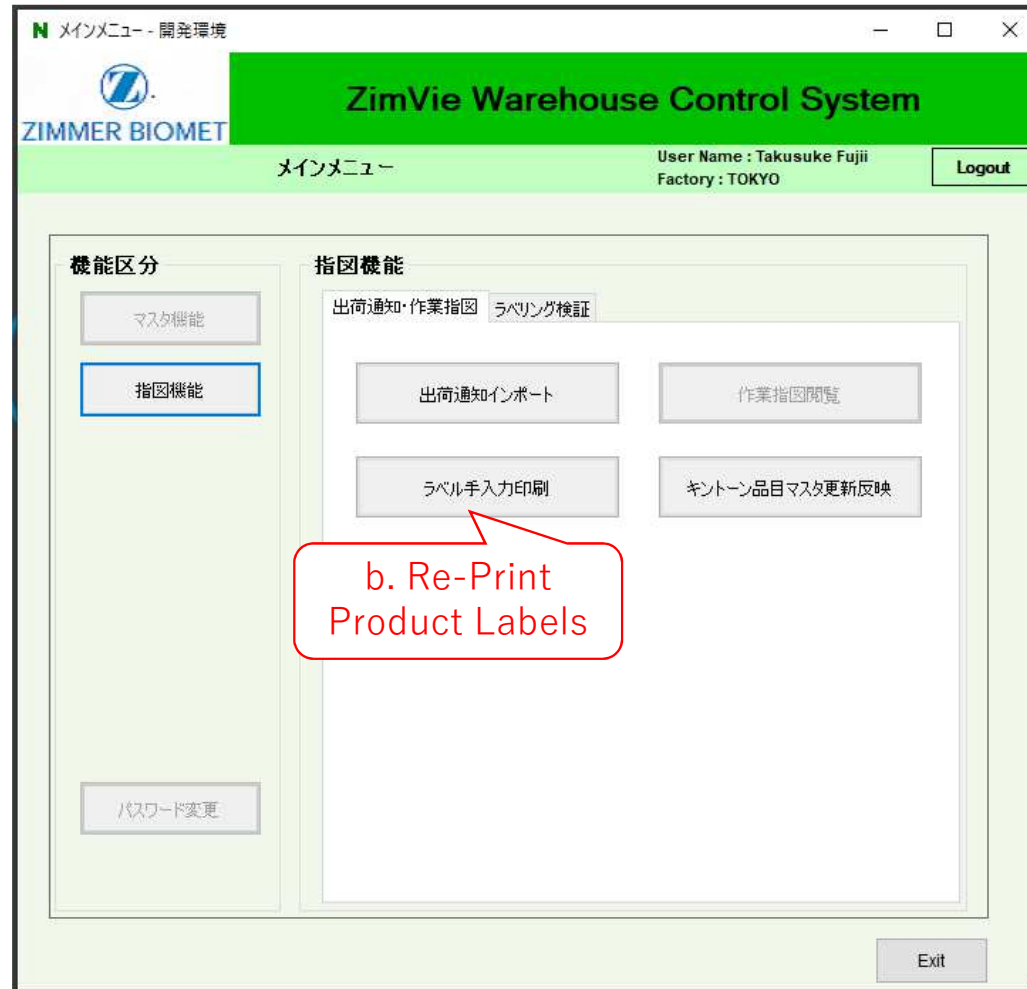
資材名	数量	ラベル	発行枚	使用枚	廃棄枚	追加発行
ボックサ付箱			101			
資材部	数量	651 128				
作業指示書		製品 ロット				
外観検査、ラベル貼付、文書添付		製品 ロット				
作業指示書		製品 ロット				
ラベル貼り前に、商品箱を開け、商品ボディを換品		不適合理由:				
作業指示書		作業メモ:				
PO:		Inw:				

明細1

Outline

- I. Login and Main Menu Structure
- II. Each Function
 - a. Import Shipping Notice
 - b. Re-Print Product Labels**
 - c. Synchronize Item Master with Kintone
 - d. Verify Product Labeling
- III. System Settings
 - e. Source Code Management
 - f. Application File Deployment
 - g. Database Server Setting

b. Re-Print Product Labels



b. Re-Print Product Labels

Product label re-printing function is available for the case of labels lost or misprinted. There are two types of label: ordinary product label, internal-purpose logistic label.

The screenshot shows the 'ラベル手入力印刷 - 開発環境' (Label Manual Input Printing - Development Environment) window. The header includes the ZIMMER BIOMET logo and 'ZimVie Warehouse'. The user is 'Takusuke Fujii' from 'Factory: TOKYO'. The form contains the following fields and annotations:

- 製品番号** (Product Number): 1020/0-6-OY. Annotation: Input item number.
- 製品名** (Product Name): 1020-06 歯肉ヒンセットジェラルド(ストレート)/175mm. Annotation: Input description displayed from item master.
- ラベル種類** (Label Type): 製品ラベル. Annotation: Label type displayed from item master.
- ロット番号** (Lot Number): 007890. Annotation: Input lot number.
- 使用期限** (Expiry Date): 2021/10/30. Annotation: Select expiry date.
- 枚数** (Quantity): 1. Annotation: Input label quantity.
- Buttons**: クリア (Clear), ラベル発行 (Issue Label), 閉じる (Close). Annotation: Send print command to the barcode printer.

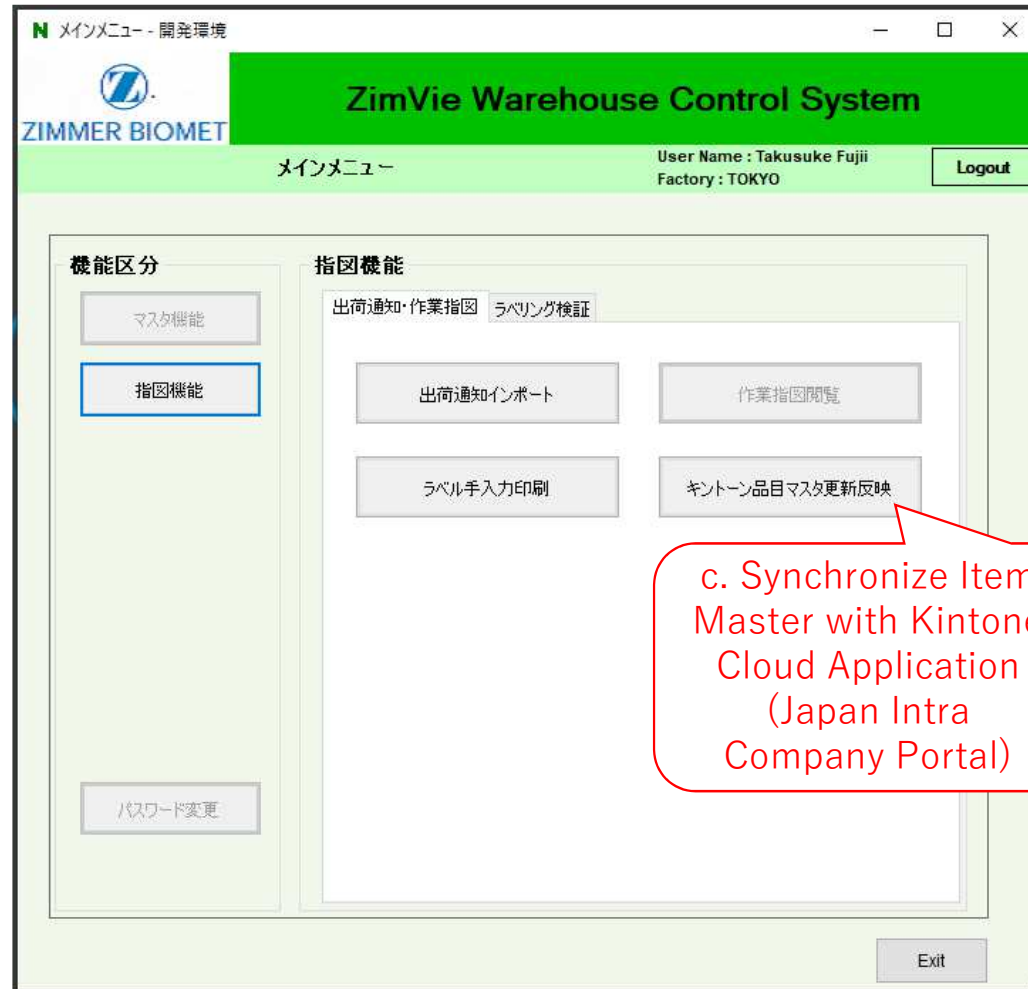
Two examples of printed labels are shown on the right, separated by a large red arrow:

- Ordinary product label**: A label for 'マイクロサージェリーセット' (Microsurgery Set) with product number 1020-06, lot number 007890, and expiry date 21/10/30. It includes a barcode and QR code.
- Internal-purpose logistic label**: A label for 'スマートペグ TYPE30 #100436(5入)' (Smart Peg TYPE30 #100436 (5 pieces)) with product number 00413721-ZB(0000413721), lot number 10000, and expiry date 21/10/07. It includes a QR code.

Outline

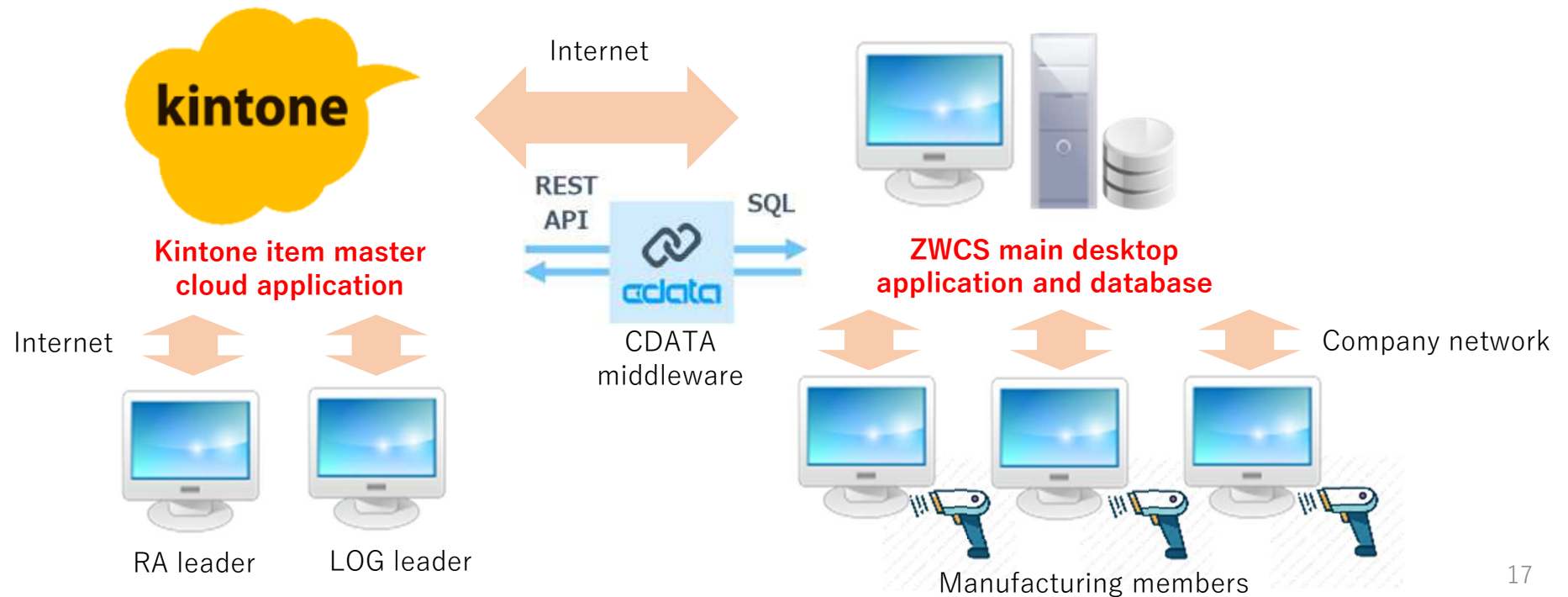
- I. Login and Main Menu Structure
- II. Each Function
 - a. Import Shipping Notice
 - b. Re-Print Product Labels
 - c. Synchronize Item Master with Kintone
 - d. Verify Product Labeling
- III. System Settings
 - e. Source Code Management
 - f. Application File Deployment
 - g. Database Server Setting

c. Synchronize Item Master with Kintone



c. Synchronize Item Master with Kintone

For Japan regulatory and logistics management purpose, Japan local item master data is controlled in Kintone application. ZWCS main desktop application runs in warehouse on-site PC with Postgres DBMS. RA and Logistics leader members manage item master in Kintone which is synchronized to ZWCS main application and database. Incidentally, work order - product label verification operation is done by manufacturing members accessing the database from each manufacturing PC.



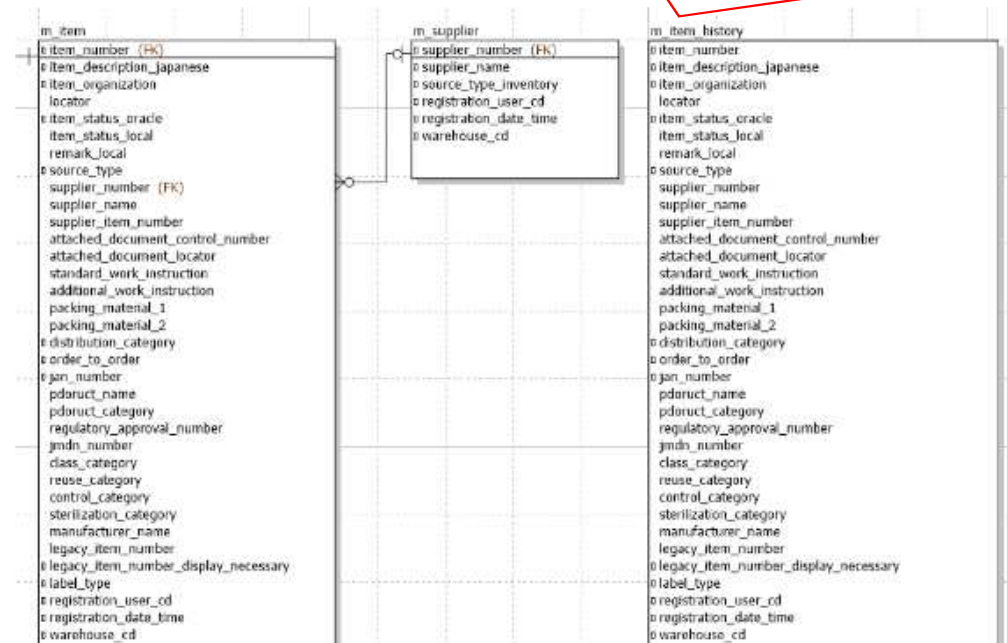
c. Synchronize Item Master with Kintone

When the Synchronize button is clicked in the main desktop application, the application read Kintone data for necessary update or creation, then update or create the record in the local database if the target item records exists. The local master record history is stored in the database for every update or create.

Synchronization result is displayed as the message to the user.



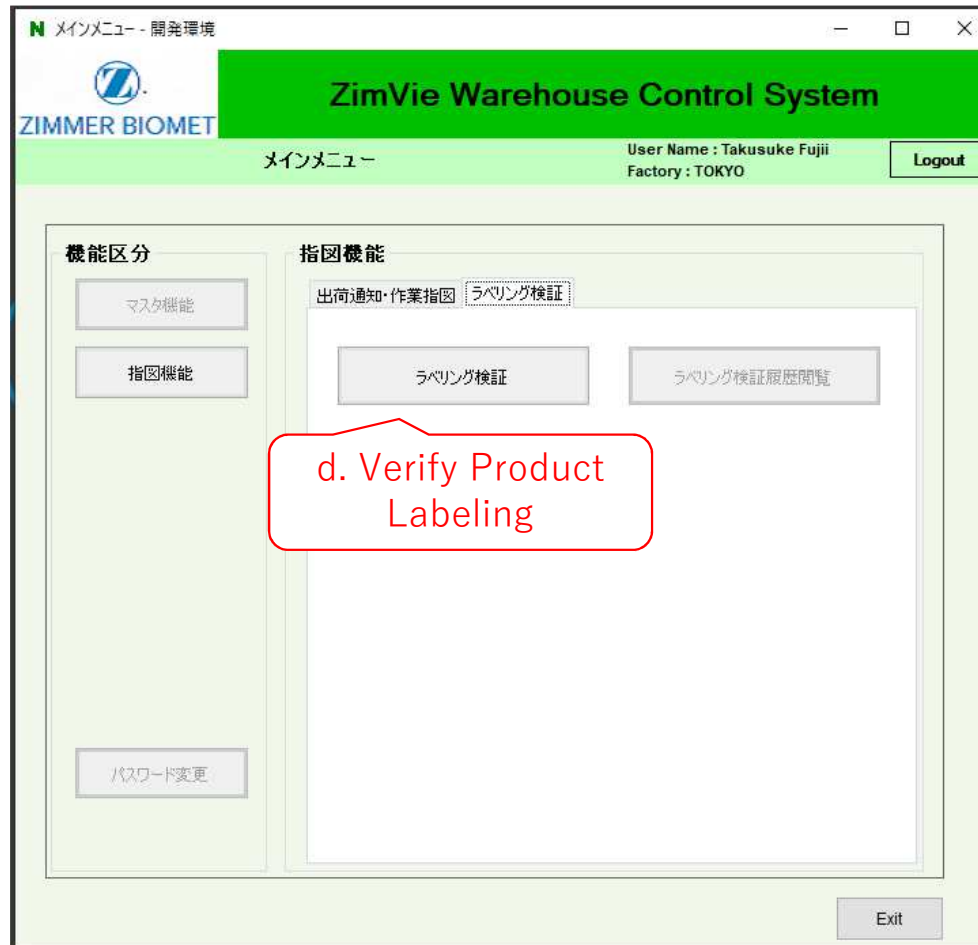
Not only the latest item master records but also every update or create history is stored in the local database.



Outline

- I. Login and Main Menu Structure
- II. Each Function
 - a. Import Shipping Notice
 - b. Re-Print Product Labels
 - c. Synchronize Item Master with Kintone
 - d. Verify Product Labeling
- III. System Settings
 - e. Source Code Management
 - f. Application File Deployment
 - g. Database Server Setting

d. Verify Product Labeling



The screenshot shows the ZimVie Warehouse Control System interface. It includes a header with the Zimmer Biomet logo and the system name. Below the header, there are several input fields for work order and product information, each with a red callout box explaining its role in the verification process:

- α. Work order no**: Points to the '指図番号' (Work Order No) field, which contains 'DS002A-220128001'.
- α. Work order line no**: Points to the '明細番号' (Work Order Line No) field, which contains '1'.
- β. Product label barcode**: Points to the 'バーコード(印字)' (Product Label Barcode) field, which contains '01045602277326731722020110202109'.
- γ. Product label barcode**: Points to the 'バーコード(ラベル)' (Product Label Barcode) field, which also contains '01045602277326731722020110202109'.
- δ. item no**: Points to the '製品番号(印字)' (Item No) field, which contains '1993'.
- ε. Lot no**: Points to the 'ロット(印字)' (Lot No) field, which contains '20210930'.

Below these fields, there is a table showing the scan results:

スキャン連番	品目番号	ロット番号
1	1993	20210930
2	1993	20210930
3	1993	20210930
4	1993	20210930
5	1993	20210930
6	1993	20210930

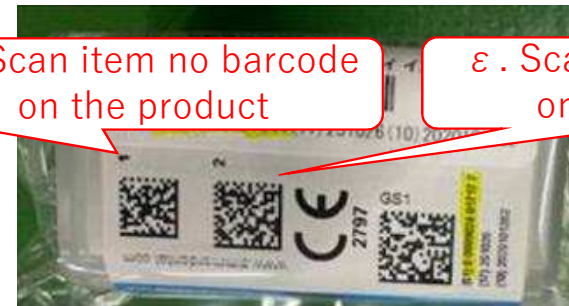
A large red callout box at the bottom explains the verification process: 'Each product is scanned for its item no and lot no. If a product does not match to the work order line info, error message is displayed, error log is recorded, and the operation is locked to let the user investigate the difference. Once the product scan count reach the work order line quantity, the application record the verification as success for the order line.'

α . Scan work order
line info: order no,
line no, and quantity

γ. Scan actually printed product label barcode. One actual label is pasted onto the order paper as the label accuracy evidence.

δ . Scan item no barcode on the product

ε . Scan lot no barcode
on the product



Outline

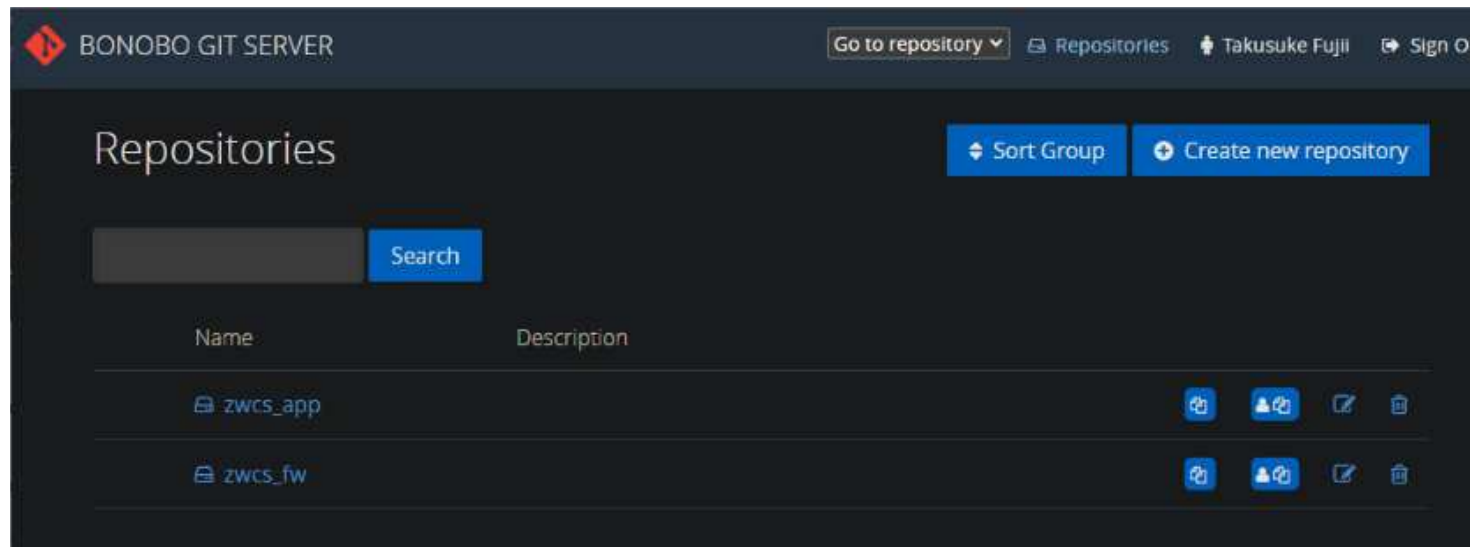
- I. Login and Main Menu Structure
- II. Each Function
 - a. Import Shipping Notice
 - b. Re-Print Product Labels
 - c. Synchronize Item Master with Kintone
 - d. Verify Product Labeling
- III. System Settings
 - e. Source Code Management
 - f. Application File Deployment
 - g. Database Server Setting

e. Source Code Management

ZWCS source code consists of two solutions. One is “Framework” solution which contains base objects to control database transaction, business logic abstraction, and UI design. The other one is “Application” solution which contains implementation objects to actually describe the ZWCS specific business logics and UI forms.

Framework repository: http://euesv-app-p67/Bonobo/zwcs_fw.git

Application repository: http://euesv-app-p67/Bonobo/zwcs_app.git



e. Source Code Management

ZWCS is a Windows Forms application applying MVC architecture.

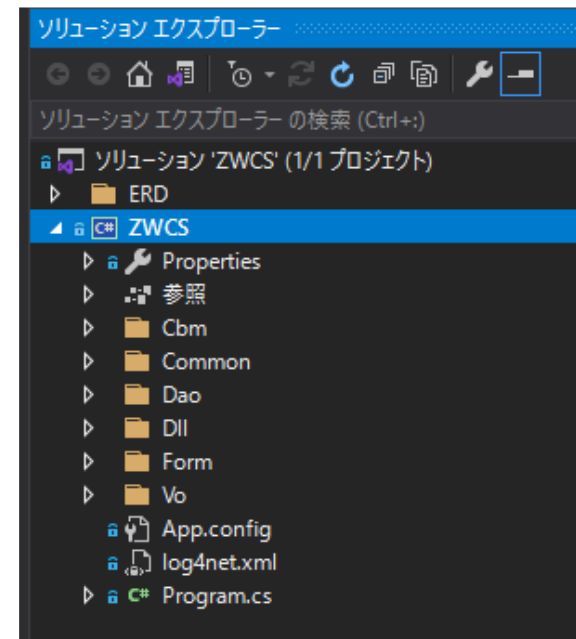
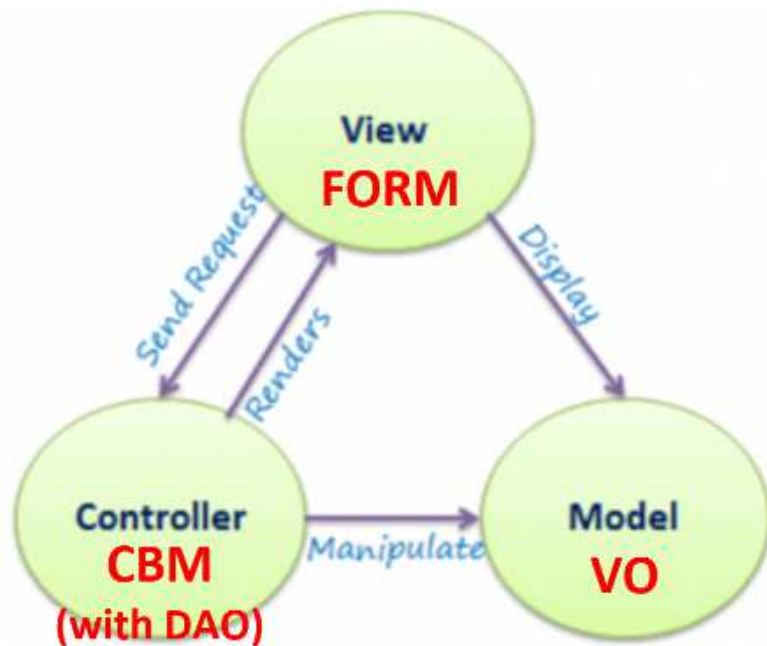
Value Object (Model) : Defines data structure

Form (View) : Defines display

Core Business Module (Controller) : Contains control logic (usually with one or more DAO)

Data Access Object : Contains database command (usually SQL command)

* Each object in the solution is stored to the corresponding folders.

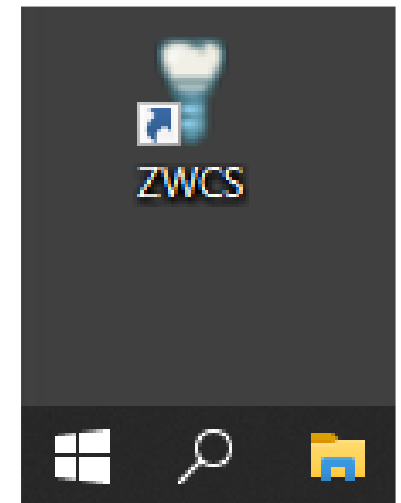
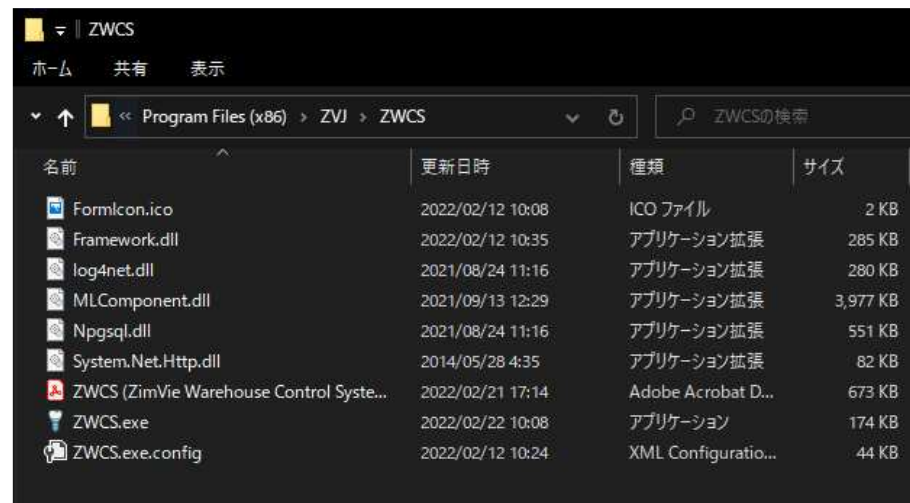
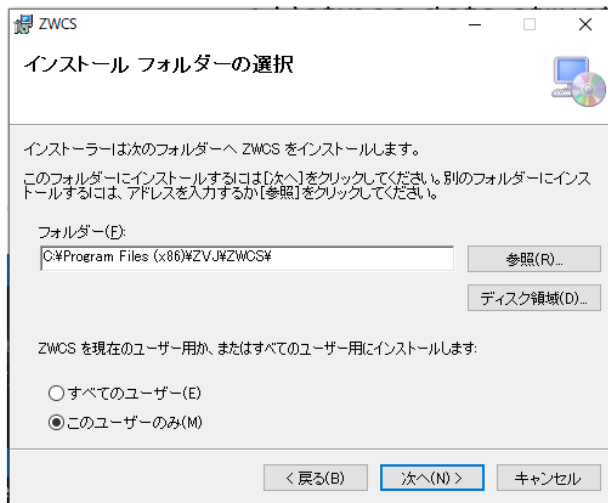
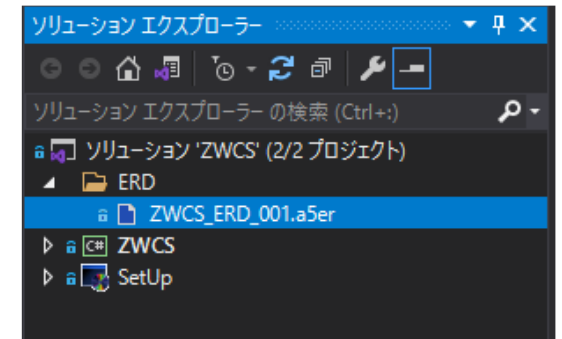
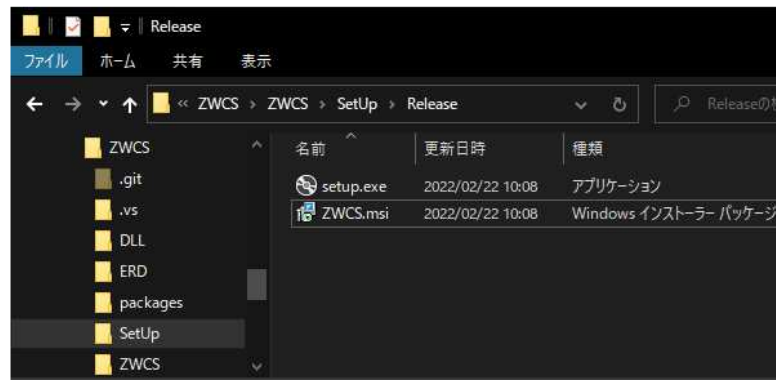
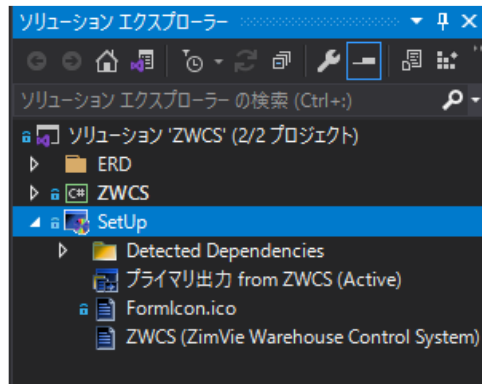


Outline

- I. Login and Main Menu Structure
- II. Each Function
 - a. Import Shipping Notice
 - b. Re-Print Product Labels
 - c. Synchronize Item Master with Kintone
 - d. Verify Product Labeling
- III. System Settings
 - e. Source Code Management
 - f. Application File Deployment**
 - g. Database Server Setting

f. Application File Deployment

ZWCS solution has Windows Installer project “SetUp”. By building this project, the installer file is created. Its execution on user’s PC results in the app’s installment to the path “C:¥Program Files (x86)¥ZVJ¥ZWCS”, with short cut to the desktop and start menu.

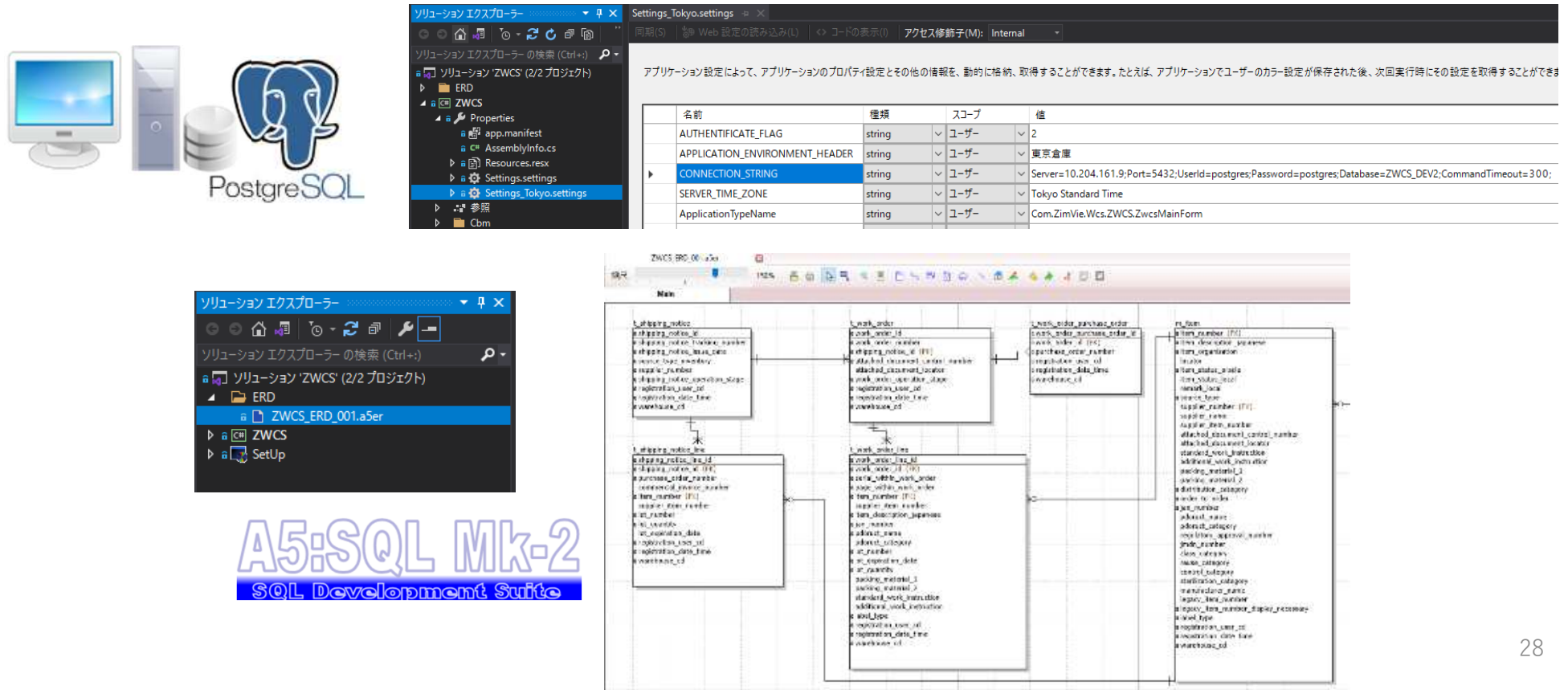


Outline

- I. Login and Main Menu Structure
- II. Each Function
 - a. Import Shipping Notice
 - b. Re-Print Product Labels
 - c. Synchronize Item Master with Kintone
 - d. Verify Product Labeling
- III. System Settings
 - e. Source Code Management
 - f. Application File Deployment
 - g. Database Server Setting

g. Database Server Setting

ZWCS is using opensource PostgreSQL 9.6 as its database. The IP address of the database can be adjusted in the setting file of ZWCS project. The database design is stored in “a5er” file in the ZWCS solution using “A5:SQL Mk-2” free tool. The tool can generate DDL(data definition language) from the ERD (entity relationship diagram).



The image displays the PostgreSQL logo on the left and the A5:SQL Mk-2 software interface on the right. The interface is divided into several panes. The top-left pane shows the 'Solution Explorer' with a tree view of the project files, including 'ERD', 'ZWCS', and 'Settings.Tokyo.settings'. The top-right pane shows the 'Settings.Tokyo.settings' file, which contains a table of application settings. The bottom-left pane shows the 'Solution Explorer' with a tree view of the project files, including 'ERD', 'ZWCS', and 'SetUp'. The bottom-right pane shows the 'ERD' (Entity Relationship Diagram) for the 'ZWCS' project, which is a complex diagram showing various tables and their relationships.

名前	種類	スコープ	値
AUTHENTICATE_FLAG	string	ユーザー	2
APPLICATION_ENVIRONMENT_HEADER	string	ユーザー	東京倉庫
CONNECTION_STRING	string	ユーザー	Server=10.204.161.9;Port=5432;UserId=postgres;Password=postgres;Database=ZWCS_DEV2;CommandTimeout=300;
SERVER_TIME_ZONE	string	ユーザー	Tokyo Standard Time
ApplicationTypeName	string	ユーザー	Com.ZimVie.Wcs.ZWCS.ZwcsMainForm

A5:SQL Mk-2
SQL Development Suite