# Ontology-based Expert System for a Generic Drug Production of Pharmaceutical Dosage Forms

Software Requirement Specification

By

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# Chapter 1 | Introduction

## 1.1. Identification

Software Requirement describes the requirement specification of OEGP. The Software Requirement is composed of URS, User requirement description, and SRS. The purpose of this document are making the same understanding of the stakeholder and supporting the future development.

## 1.2. Acronyms

| | |
|---|---|
| OEGP | Ontology-based Expert System for a Generic Drug Production of Pharmaceutical Dosage Forms |
| PDPO | Pharmaceutical Dosage Form Production Ontology |
| URS | User Requirement Specification |
| SRS | System Requirement Specification |

# Chapter 2 | User Scenario and User Characteristic

## 2.1 User Scenario

The client want to use the OEGP on the tablet computer. The client need login before using the program. The program should show the current user after the user login to the system. The first page of program should be menu which consists of the history, evaluate case, manage a case and calculate drug reformulation as a generic version. The client need 3 types of the user. The first one is general pharmacists. The general pharmacists can register as member by sending the request to the administrator. The general pharmacist can use the system for evaluation and calculate drug reformulation. They also view their drug reformulate history. The drug reformulate history can search by drug's name and date. The second type of user is an administrator. The administrator can manage the member, drug formulation cases and substance in the program. They can approve the member register and change authorize status of member. They can change member status from general pharmacist to an expert pharmacist or the expert pharmacist to the general pharmacist. The administrator also add a new case in the program, update the existing case in the system and delete a case. The last user is expert pharmacists. The expert pharmacists come from general pharmacists. The expert pharmacist cannot register by themselves. This user must change by administrator. The expert pharmacists can use the program similar with the administrator but the expert pharmacists cannot manage make the member management.

## 2.2 User Characteristic

- General Pharmacists – The general pharmacist can use system for making drug reformulation to the generic version. They also see the reformulation history and evaluate the system.
- Expert Pharmacists – The expert pharmacists can make an activity with the system like the general pharmacists, but the expert pharmacists can manage the pharmaceutical ontology such as manage substance property, substance, excipient, and tablet formulation.
- Administrator- The administrator can make the activities like the general pharmacists and the expert pharmacists, but the administrator can manage the user account.

From this User scenario and User Characteristic above, it can divide into use case diagram. The diagram is illustrated in Figure 1.

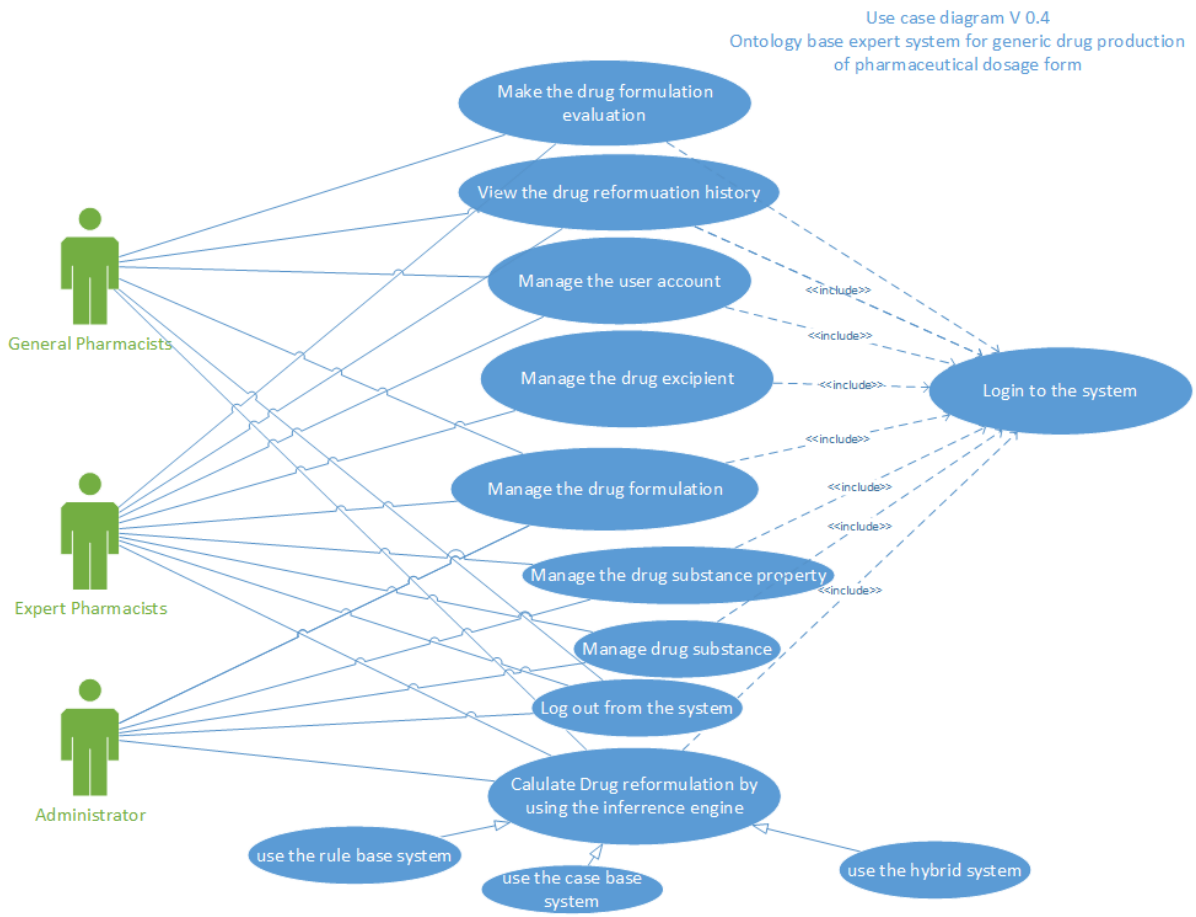


Figure 1: The use case diagram

# Chapter 3 | Requirement Specification

## 3.1. Functional Requirement

### 3.1.1. User Requirement Specification (URS)

From the use case diagram at the figure 1, there are 10 sub-features in the OEGP. The sub-feature can divide into the User Requirement Specification. The User Requirement Specification (URS) is illustrated on the table.

| No | Use case | URS No. | URS Name | Actor |
|---|---|---|---|---|
| 1 | Manage the user account | URS-01 | The user registers as a member. | General Pharmacists |
| | | URS-02 | The user updates their information. | General Pharmacists, Expert Pharmacists, Administrator |
| | | URS-03 | The Administrator deletes the member account. | Administrator |
| | | URS-04 | The Administrator approves a general pharmacist registration. | |
| | | URS-05 | The Administrator changes an authorized person status. | |
| 2 | Calculate the drug reformulation by using the inference engine. | URS-06 | The user calculates a drug reformulation by using an inference engine. | General Pharmacists, Expert Pharmacists, Administrator |
| 3 | View the drug reformulation history | URS-07 | The user views their drug reformulation history. | General Pharmacists, Expert Pharmacists, Administrator |
| 4 | Make the drug reformulation evaluation | URS-08 | The user makes the drug reformulation evaluation. | General Pharmacists, Expert Pharmacists, Administrator |
| 5 | Manage the drug substance property | URS-09 | The user adds a new substance property into the system. | Expert Pharmacists, Administrator |
| | | URS-10 | The user updates an existing substance property into the system. | |
| | | URS-11 | The user deletes an existing substance property from the system. | |
| 6 | Manage the drug substance | URS-12 | The user adds a new substance into the system. | Expert Pharmacists, Administrator |
| | | URS-13 | The user updates an existing substance into the system. | |
| | | URS-14 | The user deletes an existing substance from the system. | |
| | | URS-15 | The user views the substance in the system. | |
| 7 | Manage the drug excipient | URS-16 | The user adds a new excipient to the system. | Expert Pharmacists, Administrator |
| | | URS-17 | The user updates an existing drug excipient in the system. | |

| | | | | |
|---|---|---|---|---|
| | | URS-18 | The user delete an existing drug excipient in the system. | |
| | | URS-19 | The user views all the drug excipient in the system. | |
| 8 | Manage the drug formulation | URS-20 | The user adds a new drug formulation case into the system. | Expert Pharmacists, Administrator |
| | | URS-21 | The user updates an existing drug formulation case in the system. | |
| | | URS-22 | The user deletes an existing drug formulation case in the system. | |
| | | URS-23 | The user views all of the formulation in the system. | |
| 9 | Login to the system | URS-24 | The user logins to the system. | General Pharmacists, Expert Pharmacists, Administrator |
| 10 | Logout from the system | URS-25 | The user logouts from the system. | General Pharmacists, Expert Pharmacists, Administrator |

### 3.1.2. User Requirement Description

## Use case1: Manage the user account

### URS-01: The user registers as a member.

Description

| | | | |
|---|---|---|---|
| **User Requirement Specification ID:** | URS-01 | | |
| **User Requirement Specification Name:** | The user registers as a member. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 1, 2014 | **Last Revision Date :** | April 12, 2014 |
| **Actor:** | General Pharmacists | | |
| **Description:** | URS-01 is used, when the user wants to use the OEGP at the first time. | | |
| **Trigger:** | The user selects “Register” to create a general pharmacist account. | | |
| **Pre-condition:** | N/A | | |
| **Post-condition:** | • The system saves user information into a system.<br>• An administrator receives a member registration request from the user. | | |
| **Input data** | **Input name** | **Example** | **Description** |
| | Email | “member01@gmail.com” | The email should be the same as the email address that user used. |
| | Password | “pass01” | The password of the user should have a length 4-15 characters. |
| | Confirm password | “pass01” | The password of the user should have a length 4-15 characters. |
| **Normal Flow:** | 1. The user opens the registration page for creating a new member account.<br>2. The user inputs email and password for member registration.<br>3. The user selects a submit symbol for sending the member registration to administrator.<br>4. The system verifies email and password format.<br>5. The system save the user information to the system.<br>6. The system sends the registration request to the administrator.<br>7. The system displays the sending registration to administrator successful page. | | |
| **Alternative Flow:** | • In step 4 of the normal flow, if the user inputs a password less than 4 characters or more than 15 characters.<br>1. The system shows an error message about a password less than 4 characters or more than 15 characters.<br>2. The user go back to do a step 2 of the normal flow again.<br><br>• In step 3 of the normal flow, if the user selects “cancel” instead of “submit."<br>1. The system shows the login page of the program. | | |

| | |
|---|---|
| | • In step 3 of the normal flow, if the user selects “reset” instead of “submit."<br>1. The system resets the user information for member registration such as email and password. |
| **Exception:** | • In step 4 of the normal flow, if the user inputs a password less than 4 characters or more than 15 characters.<br>1. The system shows an error message about a password less than 4 characters or more than 15 characters.<br>2. The user go back to do step 2 of the normal flow again.<br><br>• In step 4 of the normal flow, if the user inputs a confirm password not equal with the password.<br>1. The system shows the error message about a confirm password not same as the password.<br>2. The user go back to do a step 2 of the normal flow again.<br><br>• In step 4 of the normal flow, if the user inputs an email in a wrong format<br>1. The system shows an error message about the email format is wrong.<br>2. The user go back to do step 2 of the normal flow again.<br><br>• In step 4 of the normal flow, if the email is already used<br>3. The system shows an error message about the email is already used.<br>4. The user go back to do step 2 of the normal flow again.<br><br>• In all of step of the normal flow, if the system disconnects from an internet.<br>1. The system shows an error message about internet disconnection. |
| **Include:** | N/A |

URS 01: System requirement specification (SRS)

| No | System requirement specification (SRS) |
|---|---|
| SRS-01 | The system provides the Graphic user interface (GUI) which receive email, password and confirm password. |
| SRS-02 | The system can check the password format. The password must be 4-15 character. |
| SRS-03 | The system can check the email format. The email must be the email format. |
| SRS-04 | The system can check the confirm password format. The confirm password must be 4-15 character and same as password. |
| SRS-05 | The system save the user information to the system. |
| SRS-06 | The system shall send the request of a member registration to an administrator. |
| SRS-07 | The system shall show the successful sending request member registration page. |
| SRS-08 | The system shall display the error message “The password length should be 4-15”. |
| SRS-09 | The system shall display the error message “The email format is not correct”. |
| SRS-10 | The system shall display the error message “The email is already used” |
| SRS-11 | The system shall display the error message “The confirm password is not same as password”. |
| SRS-12 | The system shall display the error message “The system is disconnect from the internet”. |

URS-02: The user updates their information.

Description

| | | | |
|---|---|---|---|
| **User Requirement Specification ID:** | URS-02 | | |
| **User Requirement Specification Name:** | The user updates their information. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 2, 2014 | **Last Revision Date :** | April 12, 2014 |
| **Actor:** | General Pharmacists, Expert Pharmacists, Administrator | | |
| **Description:** | URS-02 is used, when the user wants to update their information. | | |
| **Trigger:** | The user selects “update” to update information of the user. | | |
| **Pre-condition:** | • The user must log into the system. | | |
| **Post-condition:** | • The system saves the user information into a system. | | |
| **Input data** | **Input name** | **Example** | **Description** |
| | Password | “pass02” | The password of the user should have a length 4-15 characters. |
| | Confirm password | “pass02” | The password of the user should have a length 4-15 characters. |
| **Normal Flow:** | 1. The user opens updating information page.<br>2. The system shows the existing user information such as the password.<br>3. The user inputs a new password and confirm password for information updating.<br>4. The user selects “confirm” to update the information.<br>5. The system validates the password format.<br>6. The system saves the information updating into the system. | | |

| | |
|---|---|
| | 7. The system shows updating information successfully page. |
| **Alternative Flow:** | • In step 3 of the normal flow, if user selects “cancel” instead of “confirm”<br>1. The system shows the main page of the program. |
| **Exception:** | • In step 4 of the normal flow, if the user inputs a password less than 4 characters or more than 15 characters.<br>1. The system shows an error message about a password less than 4 characters or more than 15 characters.<br>2. The user go back to do step 2 of the normal flow again.<br><br>• In step 4 of the normal flow, if the user inputs a confirm password not equal with the password.<br>1. The system shows the error message about a confirm password not same as the password.<br>2. The user go back to do a step 2 of the normal flow again.<br><br>• In all of step of the normal flow, if the system disconnects from an internet.<br>1. The system shows an error message about internet disconnection. |
| **Include:** | URS-24 |

URS 02: System requirement specification (SRS)

| **No** | **System requirement specification (SRS)** |
|---|---|
| SRS-13 | The system provides the Graphic user interface (GUI) which receive the password and confirm password for user information updating. |
| SRS-02 | The system can check the password format. The password must be 4-15 character. |
| SRS-03 | The system can check the confirm password format. The confirm password must be 4-15 character and same as password. |
| SRS-14 | The system shall update the user information in the system. |
| SRS-15 | The system shall show the successful sending member updating page. |
| SRS-08 | The system shall display the error message “The password length should be 4-15”. |
| SRS-11 | The system shall display the error message “The confirm password is not same as password”. |
| SRS-12 | The system shall display the error message “The system is disconnect from the internet”. |

### URS-03: The administrator deletes the member account.

Description

| | | | |
|---|---|---|---|
| **User Requirement Specification ID:** | URS-03 | | |
| **User Requirement Specification Name:** | The Administrator deletes the member account. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 12, 2014 | **Last Revision Date :** | May 20, 2014 |
| **Actor:** | Administrator | | |
| **Description:** | URS-03 is used, when the administrator wants to delete the existing user account from the system. | | |
| **Trigger:** | The user select "delete the existing user" for deleting the existing user from the system. | | |
| **Pre-condition:** | • The administrator must log into the system. | | |
| **Post-condition:** | • The system deletes the existing user from the system. | | |
| **Input data** | **Input name** | **Example** | **Description** |
| | The member email | "member01@gmail.com" | The email should be the same as the email address that user used. |
| **Normal Flow:** | 1. The user opens deleting the existing member page.<br>2. The system shows the list of member's username from the system.<br>3. The administrator chooses the member username from a list of member username.<br>4. The administrator selects "delete" for deleting the existing member account from the system.<br>5. The system shows the alert message for checking the member account deleting.<br>6. The administrator selects "Yes" for confirming to delete the member account.<br>7. The system deletes the member account from the system.<br>8. The system shows deleting the existing substance successful page. | | |
| **Alternative Flow:** | • In step 3 of the normal flow, if the user uses search bar for searching the member account by using the member's email instead of selecting the member's email from the list of member's username.<br>1. The administrator inputs the member's email in the search bar.<br>2. The administrator selects "searching" for searching the existing member account in the system.<br>3. The system shows the information of the member.<br>4. The step of this use case is resumed at step 2 of the normal flow.<br>• In the step 6 of the normal flow, if the user selects "cancel" instead of selecting "Yes".<br>1. The system shows the main page of the program. | | |
| **Exception:** | • In all of step of the normal flow, if the system disconnects from an internet. | | |

| | |
|---|---|
| | 1. The system shows the error message about internet disconnection. |
| **Include:** | URS-24 |

URS 03: System requirement specification (SRS)

| **No** | **System requirement specification (SRS)** |
|---|---|
| SRS-16 | The system provides the Graphic user interface (GUI) which consists the list member username. |
| SRS-17 | The system shows the detail of the member account such as member email and register date. |
| SRS-18 | The system shows the Confirm dialog box (YES/NO option).The confirm dialog is used for confirming to delete member account. |
| SRS-19 | The system deletes the member account from the account that selected by administrator. |
| SRS-20 | The system shall show the successful member account deleting. |
| SRS-21 | The system provides a search bar for searching the member account. The search bar uses the member's email for searching. |
| SRS-12 | The system shall display the error message "The system is disconnect from the internet". |

## URS-04: The administrator approves a general pharmacist registration.

### Description

| | | | |
|---|---|---|---|
| **User Requirement Specification ID:** | URS-04 | | |
| **User Requirement Specification Name:** | The administrator approves a general pharmacist registration. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 2, 2014 | **Last Revision Date :** | May 20, 2014 |
| **Actor:** | Administrator | | |
| **Description:** | URS-04 is used, when the administrator wants to approve a member registration that request from a person who wants to be the general pharmacist. | | |
| **Trigger:** | The administrator selects “approve member registration” to approve a member registration. | | |
| **Pre-condition:** | • The administrator must log into the system.<br>• The administrator must receive a request of member registration from the general pharmacists. | | |
| **Post-condition:** | • The system saves information about approving member registration into the system.<br>• The system sends an email to the person who wants to be general pharmacist about member registration is successful.<br>• The system sends an email to the person who wants to be general pharmacist about member registration is not approve by an administrator. This post-condition is used when the user selects “cancel” in Alternative flow. | | |
| **Input data** | **Input Name** | **Example** | **Description** |
| | The member email | “member01@gmail.com” | The email should be the same as the email address that user used. |
| **Normal Flow:** | 1. The administrator opens the approving member registration page.<br>2. The system shows the list of the general pharmacist registration that request from the person who wants to be the general pharmacist.<br>3. The administrator chooses the request that want to approve as the general pharmacist.<br>4. The administrator selects “confirm” to approve the request of member registration.<br>5. The system approves the member account that selected by the administrator.<br>6. The system sends the member registration successful message to the member email.<br>7. The system shows approving member registration is successfully. | | |
| **Alternative Flow:** | • In step 3 of the normal flow, if user select “cancel” instead of “confirm”<br>1. The system cancels the request of member registration.<br>2. The system shows the main page of the program. | | |

| | |
|---|---|
| **Exception:** | • In all of step of the normal flow, if the system disconnects from an internet<br>1. The system shows the error message about internet disconnection. |
| **Include:** | URS-15,URS-24 |

URS 04: System requirement specification (SRS)

| **No** | **System requirement specification (SRS)** |
|---|---|
| SRS-16 | The system provides the Graphic user interface (GUI) which consists the list member username. |
| SRS-17 | The system shows the detail of the member account such as member email and register date. |
| SRS-22 | The system approve the member account in the system. |
| SRS-23 | The system send the member registration successful message to the member email. |
| SRS-24 | The system shall show the successful member registration approving page. |
| SRS-21 | The system provides a search bar for searching the member account. The search bar uses the member's email for searching. |
| SRS-12 | The system shall display the error message "The system is disconnect from the internet". |

URS-05: The administrator changes an authorized person status.

Description

| | | | |
|---|---|---|---|
| **User Requirement Specification ID:** | URS-05 | | |
| **User Requirement Specification Name:** | The administrator changes an authorized person status. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 2, 2014 | **Last Revision Date :** | May 20, 2014 |
| **Actor:** | Administrator | | |
| **Description:** | URS-05 is used, when the administrator wants to change the authorized person status from a general pharmacist to an expert pharmacist. | | |
| **Trigger:** | The administrator selects “change authorized person” to change the status of the members | | |
| **Pre-condition:** | • The administrator must log into the system.<br>• The system must have at least one of general pharmacist in the system. | | |
| **Post-condition:** | • The system saves the changing of authorized person status into a system.<br>• The system sends the email to a person who has been changed the authorized person status by administrator. | | |
| **Input data** | **Input name** | **Example** | **Description** |
| | Member email | “member01@gmail.com” | The email should be the same as the email address that user used. |
| | Authorize status | “expert pharmacist” | The authorize status should be the characters. |
| **Normal Flow:** | 1. The administrator opens the changing authorized person status page.<br>2. The system shows the list of member username from the system.<br>3. The administrator chooses the member username for the authorize status changing.<br>4. The system shows the member detail which consist of email and registration date and authorize status.<br>5. The administrator select “change authorized status”.<br>6. The system shows alert message for checking the authorized status changing.<br>7. The administrator selects “confirm” to confirm an authorize status changing.<br>8. The system updates the authorize status that selected by the administrator.<br>9. The system sends the changing authorize status successful message to the member email.<br>10. The system shows the changing authorized person status is successfully. | | |

| | |
|---|---|
| **Alternative Flow:** | • In step 3 of the normal flow, if the user uses search bar for searching the member by member email instead of selecting the member email in the list of member email.<br>1. The administrator inputs the member email into the search bar.<br>2. The administrator selects "submit" for searching the member by the email.<br>3. The system shows the member email.<br>4. The process of this use case is continuing at step 5 of the normal flow. |
| **Exception:** | • In all of step of the normal flow, if the system disconnects from an internet<br>1. The system shows the error message about internet disconnection. |
| **Include:** | URS-24 |

### URS 05: System requirement specification (SRS)

| **No** | **System requirement specification (SRS)** |
|---|---|
| SRS-16 | The system provides the Graphic user interface (GUI) which consists the list member in the system. |
| SRS-17 | The system shows the detail of the member account such as member email and register date. |
| SRS-25 | The system provides the Graphic user interface (GUI) which consist the method of authorized person status changing. |
| SRS-26 | The system update the authorize status to system that selected by the administrator. |
| SRS-27 | The system send the changing authorized status successful message to the member email. |
| SRS-28 | The system shall show the successful member registration approving page. |
| SRS-21 | The system provides a search bar for searching the member account The search bar use the member's email for searching. |
| SRS-12 | The system shall display the error message "The system is disconnect from the internet". |

## Use case2: Calculate the drug reformulation by using the inference engine.

### URS-06: The user calculates a drug reformulation by using an inference engine.

#### Description

| | | | |
|---|---|---|---|
| **User Requirement Specification ID:** | URS-06 | | |
| **User Requirement Specification Name:** | The user calculates a drug reformulation by using an inference engine. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 2, 2014 | **Last Revision Date :** | April 2, 2014 |
| **Actor:** | General Pharmacists, Expert Pharmacists, Administrator | | |
| **Description:** | URS-06 is used, when the user wants to calculate a drug reformulation as a generic version by using an inference engine. | | |
| **Trigger:** | The user selects "Calculate" to calculate drug reformulation as a generic version. | | |
| **Pre-condition:** | • The user must log into the system. | | |
| **Post-condition:** | • The system saves the user information into a system. | | |

| **Input data** | **Part** | **Name** | **Example** | **Description** |
|---|---|---|---|---|
| | Active Pharmaceutical ingredient (API) | Name | "Paracetamol" | The word should be the character. |
| | | Amount of strength | 500.00 | The value should be the float value. |
| | | Solubility | "Sparing soluble" | The word should be the character. |
| | | Flow ability | "Poor" | The word should be the character. |
| | | Compatibility | "Good" | The word should be the character. |
| | | Temperature Stability | "Stable" | The word should be the character. |
| | | Moisture Stability | "Stable" | The word should be the character. |
| | DF properties | Total weight | 630.00 | The value should be the float number. |
| | | Disintegration Time | 28 | The value should be the Integer value. |

| | | | | |
|---|---|---|---|---|
| | | Hardness | 8.30 | The value should be the float number. |
| | | Dissolution Profile | 81.31 | The value should be the float number. |
| | Substances | Substances' name | "Microcrystalline cellulose" | The word should be the character. |

| | |
|---|---|
| **Normal Flow:** | 1. The user opens the calculate drug reformulation page<br>2. The user inputs the Pharmaceutical value such as active Pharmaceutical ingredient (API), DF Properties and substance.<br>3. The user selects the evaluation symbol for calculate drug reformulation.<br>4. The system shows the menu of an inference engine. The menu consist of rule base system, case base reasoning system and hybrid system.<br>5. The user selects some of an inference engine from the menu of an inference engine for making calculation.<br>6. The system calculates the drug reformulation.<br>7. The system shows the result that include appropriate manufacturing and substance. |
| **Alternative Flow:** | N/A |
| **Exception:** | • In step 2 of the normal flow, if the user inputs a name at API part in a wrong format.<br>1. The system shows the error message about the name format is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 2 of the normal flow, if the user inputs an Amount of strength at API part in a wrong format.<br>1. The system shows the error message about Amount of strength format is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 2 of the normal flow, if the user inputs a solubility at API part in a wrong format.<br>1. The system shows the error message about the solubility format is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 2 of the normal flow, if the user inputs a flow ability at API part in a wrong format.<br>1. The system shows the error message about the flow ability format is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 2 of the normal flow, if the user inputs a compatibility at API part in a wrong format. |

| | |
|---|---|
| | 1. The system shows the error message about the compatibility format is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 2 of the normal flow, if the user inputs a temperature Stability at API part in a wrong format.<br>1. The system shows the error message about the temperature Stability format is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 2 of the normal flow, if the user inputs a moisture stability at API part in a wrong format.<br>1. The system shows the error message about the moisture stability format is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 2 of the normal flow, if the user inputs a Total weight at DF properties part in a wrong format.<br>1. The system shows the error message about Total weight format is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 2 of the normal flow, if the user inputs a Disintegration Time at DF Properties in a wrong format.<br>1. The system shows the error message about Disintegration Time format is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 2 of the normal flow, if user inputs a Hardness at DF Properties in the wrong format.<br>1. The system shows the error message about Hardness format is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 2 of the normal flow, if user inputs Dissolution Profile at DF Properties in the wrong format.<br>1. The system shows the error message about Dissolution Profile format is wrong.<br>2. The user go back to the step 2 of the normal flow again.<br><br>• In step 2 of the normal flow, if the user inputs an substance name at substance part in the wrong format.<br>1. The system shows the error message about Total weight format is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In all of step of the normal flow, if the system disconnects from an internet |

| | |
|---|---|
| | 1. The system shows the error message about internet disconnection. |
| **Include:** | URS-24 |

URS 06: System requirement specification (SRS)

| No | System requirement specification (SRS) |
|---|---|
| SRS-29 | The system provides the Graphic user interface (GUI) which receive active Pharmaceutical ingredient (API), DF Properties and substance. |
| SRS-30 | The system can check the name format at Pharmaceutical ingredient (API).The name format must be a character. |
| SRS-31 | The system can check the amount of strength format at Pharmaceutical ingredient (API).The amount of strength format must be a decimal value. |
| SRS-32 | The system can check the solubility format at Pharmaceutical ingredient (API).The solubility format must be a character. |
| SRS-33 | The system can check the flow ability format at Pharmaceutical ingredient (API).The flow ability format must be a character. |
| SRS-34 | The system can check the compatibility format at Pharmaceutical ingredient (API).The Compatibility format must be a character. |
| SRS-35 | The system can check the temperature Stability format at Pharmaceutical ingredient (API).The Temperature Stability format must be a character. |
| SRS-36 | The system can check the Moisture Stability format at Pharmaceutical ingredient (API).The Moisture Stability format must be a character. |
| SRS-37 | The system can check the total weight at DF property. The total weight must be a float value. |
| SRS-38 | The system can check the disintegration time. The disintegration time must be an integer value. |
| SRS-39 | The system can check the hardness at DF property. The hardness must be a float value. |
| SRS-40 | The system can check the Dissolution Profile at DF property. The Dissolution Profile must be a float value. |
| SRS-41 | The system can check the substance name at substance. The substance must be a character. |
| SRS-42 | The system provides the inference engine page .the page is included case base reasoning system, rule base system and hybrid system. |
| SRS-43 | The system calculates drug reformulation by using the inference engine that the user selected. |
| SRS-44 | The system shows the results page that include manufacturing and appropriate substance. |
| SRS-45 | The system shall display the error message “The name must be the character”. |
| SRS-46 | The system shall display the error message “The solubility must be the character”. |
| SRS-47 | The system shall display the error message “The flow ability must be the character”. |
| SRS-48 | The system shall display the error message “The compatibility must be the float value”. |
| SRS-49 | The system shall display the error message “The amount of strength must be the float value”. |
| SRS-50 | The system shall display the error message “The temperature Stability must be the character”. |

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|---|---|
| SRS-51 | The system shall display the error message “The Moisture Stability must be the character”. |
| SRS-52 | The system shall display the error message “The total weight must be the float value”. |
| SRS-53 | The system shall display the error message “The disintegration time must be the integer value”. |
| SRS-54 | The system shall display the error message “The hardness must be the float value”. |
| SRS-55 | The system shall display the error message “The dissolution profile must be the float value”. |
| SRS-56 | The system shall display the error message “The substance name must be the character”. |
| SRS-12 | The system shall display the error message “The system is disconnect from the internet”. |

## Use case3: View the drug reformulation history.

### URS-07: The user views their drug reformulation history.

Description

| | | | |
|---|---|---|---|
| **User Requirement Specification ID:** | URS-07 | | |
| **User Requirement Specification Name:** | The user views their drug reformulation history. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 2, 2014 | **Last Revision Date :** | April 2, 2014 |
| **Actor:** | General Pharmacists, Expert Pharmacists, Administrator | | |
| **Description:** | URS-07 is used, when the user wants to view the history of a drug reformulation. | | |
| **Trigger:** | The user selects "view the history" to view the history of a drug reformulation. | | |
| **Pre-condition:** | • The user must log into the system. | | |
| **Post-condition:** | • N/A | | |
| **Input date** | **Input name** | **Example** | **Description** |
| | History date | "22/01/2013" | The date should be the date format. |
| **Normal Flow:** | 1. The user opens the history of a drug reformulation page.<br>2. The system shows a list of a drug reformulation history date.<br>3. The user selects the date of drug reformulation that they want to see detail.<br>4. The system shows a detail of the history that the user selected. | | |
| **Alternative Flow:** | • In step 3 of the normal flow, if the user uses search bar for searching the history by date instead of selecting the history in a list.<br>1. The user inputs the date into the search bar.<br>2. The user selects "submit" for searching a history by date.<br>3. The system shows a list of history. | | |
| **Exception:** | • In all of step of the normal flow, if the system disconnects from an internet<br>1. The system shows the error message about internet disconnection. | | |
| **Include:** | URS-24 | | |

### URS 07: System requirement specification (SRS)

| No | System requirement specification (SRS) |
|---|---|
| SRS-57 | The system shows a list of drug reformulation history. |
| SRS-58 | The system provides a search bar for searching the history. The search bar uses the date of making drug reformulation for searching. |
| SRS-59 | The system shows the detail of the history. The history detail includes the drug's name, date, manufacturing and ingredient. |
| SRS-12 | The system shall display an error message "The system is disconnect from the internet." |

## Use case4: Make the drug reformulation evaluation.

### URS-08: The user makes a drug formulation evaluation

Description

| | | | |
|---|---|---|---|
| **User Requirement Specification ID:** | URS-08 | | |
| **User Requirement Specification Name:** | The user makess a drug reformulation evaluation. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 7, 2014 | **Last Revision Date :** | May 28, 2014 |
| **Actor:** | General Pharmacists, Expert Pharmacists, Administrator | | |
| **Description:** | URS-08 is used, when the user wants to evaluate the drug formulation in the system after they produce a real generic drug in a lab. | | |
| **Trigger:** | The user selects "Evaluate" for making drug evaluation. | | |
| **Pre-condition:** | • The user must log into the system. | | |
| **Post-condition:** | • The system saves the drug formulation evaluation into the system. | | |
| **Input data** | **Input Name** | **Example** | **Description** |
| | Dissolution Profile | 81.31 | The value should be the float number. |
| | Disintegration time | 21 | The value should be the integer number. |
| | Pharmaceutical equivalence | 3 | The word should be the integer number. |
| **Normal Flow:** | 1. The user opens drug formulation evaluation page.<br>2. The system shows a list of drug reformulation history.<br>3. The user selects a drug formulation from the list of drug reformulation history.<br>4. The system shows a detail of the history that the user selected.<br>5. The user selects "evaluate" for making drug formulation evaluation.<br>6. The user inputs the Dissolution profile, Disintegration time and Pharmaceutical equivalence of generic drug that the user produced.<br>7. The user selects "confirm" for making drug formulation evaluation.<br>8. The system evaluation reformulation. If the result is good, the system will show successful page.<br>9. The system shows the drug formulation evaluation successful page. | | |
| **Alternative Flow:** | • In step 3 of the normal flow, if the user uses a search bar for searching the history by date instead of selecting the history in a list.<br>1. The user inputs the date into the search bar.<br>2. The user selects "submit" for searching the drug formulation by date.<br>3. The system shows the drug formulation.<br>4. The step of this use case is resumed at step at step 3 of the normal flow. | | |

| | |
|---|---|
| | • In step 3 of the normal flow, if the user uses search bar for searching the history by drug name instead of selecting the history in a list.<br>1. The user inputs the drug name into the search bar.<br>2. The user selects "submit" for searching the drug formulation by date.<br>3. The system shows the drug formulation.<br>4. The step of this use case is resume at step at step 3 of the normal flow.<br><br>• In step 6 of the normal flow, if the system gets "fail" result instead of getting "successful" result.<br>1. The system shows a new drug reformulation to the user.<br><br>• In the step 5 of the normal flow, if the user selects "cancel" instead of selecting "confirm".<br>1. The system shows the administrator main page. |
| **Exception:** | • In step 4 of the normal flow, if the user inputs dissolution profile in the wrong format.<br>1. The system shows the error message about Dissolution profile format is wrong.<br>2. The user go back to do the step 4 of the normal flow again.<br><br>• In step 4 of the normal flow, if the user inputs a Disintegration time in a wrong format.<br>1. The system shows the error message about Disintegration time format is wrong.<br>2. The user go back to do the step 4 of the normal flow again.<br><br>• In step 4 of the normal flow, if the user inputs a Pharmaceutical equivalence in a wrong format.<br>1. The system shows the error message about Disintegration Time format is wrong.<br>2. The user go back to do the step 4 of the normal flow again.<br><br>• In all of step of the normal flow, if the system disconnects from an internet<br>1. The system shows the error message about internet disconnection. |
| **Include:** | URS-24 |

URS 08: System requirement specification (SRS)

| No | System requirement specification (SRS) |
|---|---|
| SRS-57 | The system shows a list of drug formulation history. |
| SRS-60 | The system provides the Graphic user interface (GUI) which receive Dissolution profile, Disintegration time and Pharmaceutical equivalence. |
| SRS-40 | The system can check the Dissolution Profile at DF property. The Dissolution Profile must be a float value. |
| SRS-58 | The system provides a search bar for searching the history. The search bar uses the date of making drug reformulation for searching. |
| SRS-61 | The system evaluate the system by using the dissolution profile, disintegration time and pharmaceutical equivalence. |
| SRS-62 | The system shall show the successful evaluate the system. |
| SRS-63 | The system shall show the fail message when the evaluation not pass. The system send the new drug reformulation to the user. |
| SRS-38 | The system can check the disintegration time. The disintegration time must be an integer value. |
| SRS-64 | The system can check the Pharmaceutical equivalence. The Pharmaceutical equivalence must be a float value. |
| SRS-53 | The system shall display an error message “The disintegration time must be an integer value." |
| SRS-55 | The system shall display an error message “The dissolution profile must be a float value." |
| SRS-65 | The system shall display an error message “The Pharmaceutical equivalence must be a float value." |
| SRS-12 | The system shall display an error message “The system is disconnect from the internet." |

## Use case5: Manage the drug substance property.

### URS-09: The user adds a new drug substance property into the system.

Description

| | | | |
|---|---|---|---|
| **User Requirement Specification ID:** | URS-09 | | |
| **User Requirement Specification Name:** | The user adds a new substance property into the system. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 7, 2014 | **Last Revision Date :** | May 22, 2014 |
| **Actor:** | Expert Pharmacists, Administrator | | |
| **Description:** | URS-09 is used, when the user wants to add a new substance property to the system. | | |
| **Trigger:** | The user selects "Add the new substance property" for adding the new substance property to the system. | | |
| **Pre-condition:** | • The user must log into the system. | | |
| **Post-condition:** | • The system saves the new substance property to the system. | | |

| **Input data** | **Part** | **Input name** | **Example** | **Description** |
|---|---|---|---|---|
| | Solubility | Type | "SlightlySolubl e" | Type should be the character |
| | | Maximum Value | 30.0 | Maximum Value should be the float number |
| | | Minimum Value | 10.12 | Minimum Value should be the float number |
| | | Solubility Value | 2.3 | Solubility Value should be the float number |
| | Degradation Mechanism | Type | "Solvolysis" | The word should be the character. The user can choose input nothing. |
| | Kinetic Reaction | Type | "PseudoFirstOr derKinetic" | The word should be the character. The user can choose input nothing |
| | Pka | Maximum Pka | 20.23 | Maximum Pka should be the float number |
| | | Minimal PKa | 10.80 | Minimal Pka should be the float number |
| | | Pka Type | "Strong" | Type should be the character |
| | | PKa Value | 4.23 | Pka Value should be the float number |
| | Partition Coefficient | Partition Coefficient Value | 2.67 | Partition Coefficient Value should be the float number |
| | | Partition Coefficient Type | "GoodAbsorbti on" | The word should be the character. |

| | | | | |
|---|---|---|---|---|
| | Solid state | Type | “CrystallineMa terials” | The word should be the character. |
| | Hygroscopici ty | Type | “Slightly hygroscopic” | The word should be the character. |
| | ParticleSize | Type | “FineParticle” | Type should be the character |
| | | Maximum Value | 2.40 | Maximum Value should be the float number |
| | | Minimum Value | 3.40 | Minimum Value should be the float number |
| | | Particle Value | 2.60 | Particle Value should be the float number |
| | Flow ability | Type | “FairFlowabilit y” | The word should be the character. |
| | Density | Type | “TrueDentity” | Type should be the character |
| | | Powder Density Value | 2.87 | Powder Density Value should be the float number |
| | Compound Function | Type | “Binder” | The word should be the character. |
| | | Value | 3.56 | The value of compound function value should be the float number. |
| **Normal Flow:** | 1. The user opens adding the new substance property page.<br>2. The user selects some of the substance properties such as Solubility, Degradation Mechanism, Kinetic Reaction, Pka, Partition Coefficient Property, Solid state, Hygroscopicity, Particle Property, Flow ability Property, Density, Salt Property, Compound Function.<br>3. The user inputs data follow the kind substance property. The example of input is illustrated on the table of input data.<br>4. The user selects “save” for adding the new substance property to the system.<br>5. The system validates the input value.<br>6. The system saves the new substance property into the system.<br>7. The system shows the adding new substance property successful page. | | | |
| **Alternative Flow:** | • In the step 3 of the normal flow, if the user selects “cancel” instead of selecting “save."<br>1. The system resume at the step 2 of normal flow. | | | |
| **Exception:** | • In step 5 of the normal flow, if the user inputs the Solubility in a wrong format.<br>1. The system shows the error message about the Solubility format is wrong.<br>2. The user go back to do the step 3 of the normal flow again.<br><br>• In step 5 of the normal flow, if the user inputs Degradation Mechanism in a wrong format. | | | |

1. The system shows the error message about the Degradation Mechanism is wrong.
2. The user go back to do the step 3 of the normal flow again.

- In step 5 of the normal flow, if the user inputs Dissolution Property in a wrong format.
  1. The system shows the error message about the Dissolution Property is wrong.
  2. The user go back to do the step 3 of the normal flow again.

- In step 5 of the normal flow, if the user inputs Kinetic Reaction in a wrong format.
  1. The system shows the error message about the Kinetic Reaction is wrong.
  2. The user go back to do the step 3 of the normal flow again.

- In step 5 of the normal flow, if the user inputs Pka in a wrong format.
  1. The system shows the error message about the Pka is wrong.
  2. The user go back to do the step 3 of the normal flow again.

- In step 5 of the normal flow, if the user inputs Partition Coefficient in a wrong format.
  1. The system shows the error message about the Partition Coefficient Property is wrong.
  2. The user go back to do the step 3 of the normal flow again.

- In step 5 of the normal flow, if the user inputs Solid state in a wrong format.
  1. The system shows the error message about the Solid state is wrong.
  2. The user go back to do the step 3 of the normal flow again.

- In step 5 of the normal flow, if the user inputs Hygroscopicity in a wrong format.
  1. The system shows the error message about the Hygroscopicity Property is wrong.
  2. The user go back to do the step 3 of the normal flow again.

- In step 5 of the normal flow, if the user inputs Particle Property in a wrong format.
  1. The system shows the error message about the Particle Property is wrong.
  2. The user go back to do the step 3 of the normal flow again.

- In step 5 of the normal flow, if the user inputs Flow ability in a wrong format.
  1. The system shows the error message about the Flow ability Property is wrong.
  2. The user go back to do the step 3 of the normal flow again.

| | |
|---|---|
| | • In step 5 of the normal flow, if the user inputs Density in a wrong format.<br>1. The system shows the error message about Density is wrong.<br>2. The user go back to do the step 3 of the normal flow again.<br><br>• In step 5 of the normal flow, if the user inputs Compound Function in a wrong format.<br>1. The system shows the error message about the Compound Function is wrong.<br>2. The user go back to do the step 3 of the normal flow again.<br><br>• In all of step of the normal flow, if the system disconnects from an internet.<br>1. The system shows the error message about internet disconnection. |
| **Include:** | URS-24 |

URS 09: System requirement specification (SRS)

| No | System requirement specification (SRS) |
|---|---|
| SRS-66 | The system provides the Graphic user interface (GUI) which receive substance property such as Solubility, Degradation Mechanism, Kinetic Reaction, Pka, Partition Coefficient Property, Solid state, Hygroscopicity, Particle Property, Flow ability Property, Density, Salt Property, Compound Function. |
| SRS-67 | The system can check the solubility type format. The solubility type format should be the characters. |
| SRS-68 | The system can check the solubility maximum format. The solubility maximum format should be the float number. |
| SRS-69 | The system can check the solubility minimal format. The solubility minimal format should be the float number. |
| SRS-70 | The system can check the solubility value format. The solubility value format should be the float number. |
| SRS-71 | The system can check the Degradation Mechanism type format. The Degradation Mechanism type format should be the characters. |
| SRS-72 | The system can check the Kinetic Reaction type format. The Kinetic Reaction type format should be the characters. |
| SRS-73 | The system can check the Particle size type format. The Particle size type format should be the characters. |
| SRS-74 | The system can check the Particle size maximum format. The Particle size maximum format should be the float number. |
| SRS-75 | The system can check the Particle size minimal format. The Particle size minimal format should be the float number. |
| SRS-76 | The system can check the Particle size value format. The Particle size value format should be the float number. |
| SRS-77 | The system can check the Partition Coefficient type format. The Partition Coefficient type format should be the characters. |
| SRS-78 | The system can check the Partition Coefficient value format. The Partition Coefficient vale format should be the float number. |

| | |
|---|---|
| SRS-79 | The system can check the Solid state type format. The Solid state type format should be the characters. |
| SRS-80 | The system can check the Hygroscopicity type format. The Hygroscopicity type format should be the characters. |
| SRS-81 | The system can check the Pka type format. The Pka type format should be the characters. |
| SRS-82 | The system can check the Pka maximum format. The Pka maximum format should be the float number. |
| SRS-83 | The system can check the Pka minimal format. The Pka minimal format should be the float number. |
| SRS-84 | The system can check the Pka value format. The Pka value format should be the float number. |
| SRS-85 | The system can check the flow ability type format. The flow ability type format should be the characters. |
| SRS-86 | The system can check the density type format. The density type format should be the characters. |
| SRS-87 | The system can check the density value format. The density value format should be the float number. |
| SRS-88 | The system can check the Compound Function type format. The Compound Function type format should be the characters. |
| SRS-89 | The system can check the Compound Function value format. The Compound Function value format should be the float number. |
| SRS-90 | The system save the substance property to the system. |
| SRS-91 | The system shall show the successful add a new substance property page. |
| SRS-92 | The system shall display the error message “The solubility type should be the characters.” |
| SRS-93 | The system shall display the error message “The solubility maximum should be the float number.” |
| SRS-94 | The system shall display the error message “The solubility minimal should be the float number.” |
| SRS-95 | The system shall display the error message “The solubility value should be the float number.” |
| SRS-96 | The system shall display the error message “The Degradation Mechanism type should be the characters.” |
| SRS-97 | The system shall display the error message “The Kinetic Reaction type should be the characters.” |
| SRS-98 | The system shall display the error message “The Pka type should be the characters.” |
| SRS-99 | The system shall display the error message “The Pka maximum should be the float number.” |
| SRS-100 | The system shall display the error message “The Pka minimal should be the float number.” |
| SRS-101 | The system shall display the error message “The Pka value should be the float number.” |
| SRS-102 | The system shall display the error message “The Partition Coefficient type should be the characters.” |
| SRS-103 | The system shall display the error message “The Partition Coefficient value should be the float number.” |
| SRS-104 | The system shall display the error message “The solid state type should be the characters.” |

| | |
|---|---|
| SRS-105 | The system shall display the error message “The Hygroscopicity type should be the characters.” |
| SRS-106 | The system shall display the error message “The particle size type should be the characters.” |
| SRS-107 | The system shall display the error message “The particle size maximum should be the float number.” |
| SRS-108 | The system shall display the error message “The particle size minimal should be the float number.” |
| SRS-109 | The system shall display the error message “The particle size value should be the float number.” |
| SRS-110 | The system shall display the error message “The Particle Property should be the characters.” |
| SRS-111 | The system shall display the error message “The Flow ability type should be the characters.” |
| SRS-112 | The system shall display the error message “The density type should be the characters.” |
| SRS-113 | The system shall display the error message “The density value should be the float number.” |
| SRS-114 | The system shall display the error message “The compound function type should be the characters.” |
| SRS-115 | The system shall display the error message “The compound function value should be the float number.” |
| SRS-12 | The system shall display the error message “The system is disconnect from the internet.” |

## URS-10: The user updates an existing substance property in the system.

### Description

| | | | |
|---|---|---|---|
| **User Requirement Specification ID:** | URS-10 | | |
| **User Requirement Specification Name:** | The user updates an existing substance property in the system. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 7, 2014 | **Last Revision Date :** | May 25, 2014 |
| **Actor:** | Expert Pharmacists, Administrator | | |
| **Description:** | URS-10 is used, when the user wants to update the existing substance property in the system. | | |
| **Trigger:** | The user selects "Update the existing substance" for updating the existing substance property in the system. | | |
| **Pre-condition:** | • The user must log into the system. | | |
| **Post-condition:** | • The systems saves the updating substance property to the system. | | |

| **Input data** | **Part** | **Input name** | **Example** | **Description** |
|---|---|---|---|---|
| | Solubility | Type | "SlightlySoluble" | Type should be the character |
| | | Maximum Value | 30.0 | Maximum Value should be the float number |
| | | Minimum Value | 10.12 | Minimum Value should be the float number |
| | | Solubility Value | 2.3 | Solubility Value should be the float number |
| | Degradation Mechanism | Type | "Solvolysis" | The word should be the character. The user can choose input nothing. |
| | Kinetic Reaction | Type | "PseudoFirstOrderKinetic" | The word should be the character. The user can choose input nothing |
| | Pka | Maximum Pka | 20.23 | Maximum Pka should be the float number |
| | | Minimal PKa | 10.80 | Minimal Pka should be the float number |
| | | Pka Type | "Strong" | Type should be the character |
| | | PKa Value | 4.23 | Pka Value should be the float number |

| | | | | |
|---|---|---|---|---|
| | Partition Coefficient | Partition Coefficient Value | 2.67 | Partition Coefficient Value should be the float number |
| | | Partition Coefficient Type | ”GoodAbsorbtion” | The word should be the character. |
| | Solid state | Type | “CrystallineMaterials” | The word should be the character. |
| | Hygroscopicity | Type | “Slightly hygroscopic” | The word should be the character. |
| | ParticleSize | Type | “FineParticle” | Type should be the character |
| | | Maximum Value | 2.40 | Maximum Value should be the float number |
| | | Minimum Value | 3.40 | Minimum Value should be the float number |
| | | Particle Value | 2.60 | Particle Value should be the float number |
| | Flow ability | Type | “FairFlowability” | The word should be the character. |
| | Density | Type | “TrueDentity” | Type should be the character |
| | | Powder Density Value | 2.87 | Powder Density Value should be the float number |
| | Compound Function | Type | “Binder” | The word should be the character. |
| | | Max Concentration | 2.0 | Maximum Value should be the float number |
| | | Min Concentration | 1.0 | Minimum Value should be the float number |
| **Normal Flow:** | 1. The user opens updating the existing substance property in the system.<br>2. The system shows all of the substance properties in the system.<br>3. The user selects the substance property from the list of substance property type.<br>4. The user inputs data follow the substance property. For example, if user selects “solubility” .the user must input type, a maximum value, minimum value and solubility value.<br>5. The user selects “save” for adding the update substance property to the system.<br>6. The user selects “confirm to update” for update the existing substance in the system.<br>7. The system validates the input value. | | | |

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|---|---|
| | 8. The system updates the existing substance property that selected by the user.<br>9. The system shows the existing substance updating successful page. |
| **Alternative Flow:** | • In step 2 of the normal flow, if the user uses search bar for searching the existing substance property by the substance property type instead of selecting the existing substance property in the list.<br>1. The user inputs the substance property type in a search bar.<br>2. The user selects “searching” for searching the existing substance property in the system.<br>3. The system shows the substance property.<br>4. The step of this use case is resumed at step 3 of the normal flow.<br><br>• In the step 3 of the normal flow, if the user selects “cancel” instead of selecting “confirm to update."<br>1. The system shows the main page of the program. |
| **Exception:** | • In step 6 of the normal flow, if the user inputs the Solubility in a wrong format.<br>1. The system shows the error message about the Solubility format is wrong.<br>2. The user go back to do the step 4 of the normal flow again.<br><br>• In step 6 of the normal flow, if the user inputs Degradation Mechanism in a wrong format.<br>1. The system shows the error message about the Degradation Mechanism is wrong.<br>2. The user go back to do the step 4 of the normal flow again.<br><br>• In step 6 of the normal flow, if the user inputs Dissolution Property in a wrong format.<br>1. The system shows the error message about the Dissolution is wrong.<br>2. The user go back to do the step 4 of the normal flow again.<br><br>• In step 6 of the normal flow, if the user inputs Kinetic Reaction in a wrong format.<br>1. The system shows the error message about the Kinetic Reaction is wrong.<br>2. The user go back to do the step 4 of the normal flow again.<br><br>• In step 6 of the normal flow, if the user inputs Pka in a wrong format.<br>1. The system shows the error message about the Pka is wrong.<br>2. The user go back to do the step 4 of the normal flow again.<br><br>• In step 6 of the normal flow, if the user inputs Partition Coefficient in a wrong format.<br>1. The system shows the error message about the Partition Coefficient is wrong.<br>2. The user go back to do the step 4 of the normal flow again. |

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|---|---|
| | • In step 6 of the normal flow, if the user inputs Solid state in a wrong format.<br>1. The system shows the error message about the Solid state is wrong.<br>2. The user go back to do the step 4 of the normal flow again.<br><br>• In step 6 of the normal flow, if the user inputs Hygroscopicity in a wrong format.<br>1. The system shows the error message about the Hygroscopicity is wrong.<br>2. The user go back to do the step 4 of the normal flow again.<br><br>• In step 6 of the normal flow, if the user inputs Particle size in a wrong format.<br>1. The system shows the error message about the Particle size is wrong.<br>2. The user go back to do the step 4 of the normal flow again.<br><br>• In step 6 of the normal flow, if the user inputs Flow ability in a wrong format.<br>1. The system shows the error message about the Flow ability is wrong.<br>2. The user go back to do the step 4 of the normal flow again.<br><br>• In step 6 of the normal flow, if the user inputs Density in a wrong format.<br>1. The system shows the error message about Density is wrong.<br>2. The user go back to do the step 4 of the normal flow again.<br><br>• In step 6 of the normal flow, if the user inputs Compound Function in a wrong format.<br>1. The system shows the error message about the Compound Function is wrong.<br>2. The user go back to do the step 4 of the normal flow again.<br><br>• In all of steps of the normal flow, if the system disconnects from an internet.<br>1. The system shows the error message about internet disconnection. |
| **Include:** | URS-24 |

URS 10: System requirement specification (SRS)

| No | System requirement specification (SRS) |
|---|---|
| SRS-66 | The system provides the Graphic user interface (GUI) which receive substance property such as Solubility, Degradation Mechanism, Kinetic Reaction, Pka, Partition Coefficient Property, Solid state, Hygroscopicity, Particle Property, Flow ability Property, Density, Salt Property, Compound Function. |
| SRS-116 | The system shows the list of the existing substance property in the system. |
| SRS-117 | The system provides the search bar for searching the list of substance property. The search bar uses the type of substance property for searching. |
| SRS-67 | The system can check the solubility type format. The solubility type format should be the characters. |
| SRS-68 | The system can check the solubility maximum format. The solubility maximum format should be the float number. |
| SRS-69 | The system can check the solubility minimal format. The solubility minimal format should be the float number. |
| SRS-70 | The system can check the solubility value format. The solubility value format should be the float number. |
| SRS-71 | The system can check the Degradation Mechanism type format. The Degradation Mechanism type format should be the characters. |
| SRS-72 | The system can check the Kinetic Reaction type format. The Kinetic Reaction type format should be the characters. |
| SRS-73 | The system can check the Particle size type format. The Particle size type format should be the characters. |
| SRS-74 | The system can check the Particle size maximum format. The Particle size maximum format should be the float number. |
| SRS-75 | The system can check the Particle size minimal format. The Particle size minimal format should be the float number. |
| SRS-76 | The system can check the Particle size value format. The Particle size value format should be the float number. |
| SRS-77 | The system can check the Partition Coefficient type format. The Partition Coefficient type format should be the characters. |
| SRS-78 | The system can check the Partition Coefficient value format. The Partition Coefficient vale format should be the float number. |
| SRS-79 | The system can check the Solid state type format. The Solid state type format should be the characters. |
| SRS-80 | The system can check the Hygroscopicity type format. The Hygroscopicity type format should be the characters. |
| SRS-81 | The system can check the Pka type format. The Pka type format should be the characters. |
| SRS-82 | The system can check the Pka maximum format. The Pka maximum format should be the float number. |
| SRS-83 | The system can check the Pka minimal format. The Pka minimal format should be the float number. |
| SRS-84 | The system can check the Pka value format. The Pka value format should be the float number. |
| SRS-85 | The system can check the flow ability type format. The flow ability type format should be the characters. |
| SRS-86 | The system can check the density type format. The density type format should be the characters. |

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|---|---|
| SRS-87 | The system can check the density value format. The density value format should be the float number. |
| SRS-88 | The system can check the Compound Function type format. The Compound Function type format should be the characters. |
| SRS-89 | The system can check the Compound Function value format. The Compound Function value format should be the float number. |
| SRS-118 | The system update the existing substance property to system that selected by the user. |
| SRS-119 | The system shall show the successful the existing substance property updating page. |
| SRS-92 | The system shall display the error message “The solubility type should be the characters.” |
| SRS-93 | The system shall display the error message “The solubility maximum should be the float number.” |
| SRS-94 | The system shall display the error message “The solubility minimal should be the float number.” |
| SRS-95 | The system shall display the error message “The solubility value should be the float number.” |
| SRS-96 | The system shall display the error message “The Degradation Mechanism type should be the characters.” |
| SRS-97 | The system shall display the error message “The Kinetic Reaction type should be the characters.” |
| SRS-98 | The system shall display the error message “The Pka type should be the characters.” |
| SRS-99 | The system shall display the error message “The Pka maximum should be the float number.” |
| SRS-100 | The system shall display the error message “The Pka minimal should be the float number.” |
| SRS-101 | The system shall display the error message “The Pka value should be the float number.” |
| SRS-102 | The system shall display the error message “The Partition Coefficient type should be the characters.” |
| SRS-103 | The system shall display the error message “The Partition Coefficient value should be the float number.” |
| SRS-104 | The system shall display the error message “The solid state type should be the characters.” |
| SRS-105 | The system shall display the error message “The Hygroscopicity type should be the characters.” |
| SRS-106 | The system shall display the error message “The particle size type should be the characters.” |
| SRS-107 | The system shall display the error message “The particle size maximum should be the float number.” |
| SRS-108 | The system shall display the error message “The particle size minimal should be the float number.” |
| SRS-109 | The system shall display the error message “The particle size value should be the float number.” |
| SRS-110 | The system shall display the error message “The Particle Property should be the characters.” |
| SRS-111 | The system shall display the error message “The Flow ability type should be the characters.” |

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|---|---|
| SRS-112 | The system shall display the error message “The density type should be the characters.” |
| SRS-113 | The system shall display the error message “The density value should be the float number.” |
| SRS-114 | The system shall display the error message “The compound function type should be the characters.” |
| SRS-115 | The system shall display the error message “The compound function value should be the float number.” |
| SRS-12 | The system shall display the error message “The system is disconnect from the internet.” |

### URS-11: The user deletes an existing substance property into the system.

Description

| | | | |
|---|---|---|---|
| **User Requirement Specification ID:** | URS-11 | | |
| **User Requirement Specification Name:** | The user deletes an existing substance property into the system. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 7, 2014 | **Last Revision Date :** | May 25, 2014 |
| **Actor:** | Expert Pharmacists, Administrator | | |
| **Description:** | URS-11 is used, when the user wants to delete the existing substance property from the system. | | |
| **Trigger:** | The user selects "delete the existing substance" for deleting the existing substance property from the system. | | |
| **Pre-condition:** | • The user must log into the system. | | |
| **Post-condition:** | • The system deletes the substance property from the system. | | |

| **Input data** | **Type** | **Input name** | **Example** | **Description** |
|---|---|---|---|---|
| | Solubility | Type | "freely soluble" | The type of substance property should be character. |

| | |
|---|---|
| **Normal Flow:** | 1. The user opens deleting the existing substance property page.<br>2. The user selects existing substance property type from the list.<br>3. The user selects "confirm to delete" for deleting the existing substance from the system.<br>4. The system shows the alert message for checking the drug substance deleting.<br>5. The user selects "Yes" for confirming to delete the member account.<br>6. The system deletes the substance property that selected by the user.<br>7. The system shows deleting the existing substance successful page. |
| **Alternative Flow:** | • In step 2 of the normal flow, if the user uses search bar for searching the existing substance property by the substance property type instead of selecting the existing substance property in the list.<br>1. The user inputs the substance property type in a search bar.<br>2. The user selects "searching" for searching the existing drug substance property in the system.<br>3. The system shows the substance property.<br>4. The step of this use case is resumed at step 3 of the normal flow.<br>• In the step 3 of the normal flow, if the user selects "cancel" instead of selecting "Yes."<br>1. The system shows the main page of the program. |
| **Exception:** | • In all of step of the normal flow, if the system disconnects from an internet.<br>2. The system shows the error message about internet disconnection. |

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|---|---|
| **Include:** | URS-24 |

URS 11: System requirement specification (SRS)

| No | System requirement specification (SRS) |
|---|---|
| SRS-116 | The system shows the list of the existing substance property in the system. |
| SRS-117 | The system provides a search bar for searching the list of substance. The search bar uses the name of the substance property for searching. |
| SRS-120 | The system shows the Confirm dialog box (YES/NO option).The confirm dialog is used for confirming to delete existing substance property. |
| SRS-121 | The system delete the existing substance property from the system that selected by the user. |
| SRS-122 | The system shall show the successful delete the existing substance property page. |
| SRS-12 | The system shall display an error message “The system is disconnect from the internet." |

## Use case6: Manage the drug substance.

### URS-12: The user adds a new substance into the system.

Description

| | | | |
|---|---|---|---|
| **User Requirement Specification ID:** | URS-12 | | |
| **User Requirement Specification Name:** | The user adds a new substance into the system. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 7, 2014 | **Last Revision Date :** | April 7, 2014 |
| **Actor:** | Expert Pharmacists, Administrator | | |
| **Description:** | URS-12 is used, when the user wants to add a new substance to the system. | | |
| **Trigger:** | The user selects "Add the new substance" for adding the new substance to the system. | | |
| **Pre-condition:** | • The user must log into the system. | | |
| **Post-condition:** | • The system saves the new substance to the system. | | |

| **Input data** | Part | Input Name | Example | Description |
|---|---|---|---|---|
| | Substance's name | Name | "Aplo" | The word should be the character. |
| | Water Solubility Property | Type | "SlightlySoluble" | The value should be the integer value. |
| | Stability Property | Degradation Mechanism | "Oxidation" | The word should be the character. |
| | | Kinetic Reaction | "FirstOrderKinetics" | The word should be the character. |
| | Dissolution Property | Type | "Weak" | The word should be the character. |
| | Partition Coefficient Property | Type | "GoodAbsorbtion" | The word should be the character. |
| | Physical Form Property | Type | "CrystallineMaterials" | The word should be the character. |
| | Hygroscopicity Property | Type | "Slightly hygroscopic" | The word should be the character. |
| | Particle Property | Type | "MicronizedParticle" | The word should be the character. |
| | Alcohol Solubility Property | Type | "FreelySoluble" | The word should be the character. |

| | | | | |
|---|---|---|---|---|
| | Flow ability Property | Type | “ExcellentFlowability” | The word should be the character. |
| | Powder Density Property | Type | “TrueIdentity” | The word should be the character. |
| | Salt Property | Pka | “Very weak” | The word should be the character. |
| | | Molecular weight | 2.57 | The value should be the float value. |
| | Weight Property | Value | 2.55 | The value should be the float value. |
| | Iconicity | Type | “good” | The word should be the character. |

| | |
|---|---|
| **Normal Flow:** | 1. The user opens adding the new substance page.<br>2. The user inputs the substance name, Water Solubility Property, Stability Property, Dissolution Property, Partition Coefficient Property, Physical Form Property, Hygroscopicity Property, Particle Property, Alcohol Solubility Property, Flow ability Property, Powder Density Property, Salt Property, Weight Property and Iconicity.<br>3. The user selects “save” for adding the new substance.<br>4. The system validates the input value.<br>5. The system saves the substance to the system<br>6. The system shows the new substance adding successful page. |
| **Alternative Flow:** | • In the step 3 of the normal flow, if the user select “cancel” instead of selecting “save”.<br>1. The system shows the main page of the program. |
| **Exception:** | • In step 4 of the normal flow, if the user inputs the substance name that same as other substance name in the system.<br>1. The system shows the error message about the substance name is already used.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 4 of the normal flow, if the user inputs the Water Solubility Property in a wrong format.<br>1. The system shows the error message about the Water Solubility Property format is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 4 of the normal flow, if the user inputs Stability Property in a wrong format.<br>1. The system shows the error message about the Stability Property is wrong.<br>2. The user go back to do the step 2 of the normal flow again. |

- In step 4 of the normal flow, if the user inputs Dissolution Property in a wrong format.
  1. The system shows the error message about the Dissolution Property is wrong.
  2. The user go back to do the step 2 of the normal flow again.

- In step 4 of the normal flow, if the user inputs Partition Coefficient Property in a wrong format.
  1. The system shows the error message about the Partition Coefficient is wrong.
  2. The user go back to do the step 2 of the normal flow again.

- In step 4 of the normal flow, if the user inputs Physical Form Property in a wrong format.
  1. The system shows the error message about the Physical Form Property is wrong.
  2. The user go back to do the step 2 of the normal flow again.

- In step 4 of the normal flow, if the user inputs Hygroscopicity Property in a wrong format.
  1. The system shows the error message about the Hygroscopicity Property is wrong.
  2. The user go back to do the step 2 of the normal flow again.

- In step 4 of the normal flow, if the user inputs Particle Property in a wrong format.
  1. The system shows the error message about the Particle Property is wrong.
  2. The user go back to do the step 2 of the normal flow again.

- In step 4 of the normal flow, if the user inputs Alcohol Solubility Property in a wrong format.
  1. The system shows the error message about the Alcohol Solubility is wrong.
  2. The user go back to do the step 2 of the normal flow again.

- In step 4 of the normal flow, if the user inputs Flow ability Property in a wrong format.
  1. The system shows the error message about the Flow ability Property is wrong.
  2. The user go back to do the step 2 of the normal flow again.

- In step 4 of the normal flow, if the user inputs Powder Density Property in a wrong format.
  1. The system shows the error message about the Powder Density is wrong.
  2. The user go back to do the step 2 of the normal flow again.

- In step 4 of the normal flow, if the user inputs Salt Property in a wrong format.

| | |
|---|---|
| | 1. The system shows the error message about the Salt Property is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 4 of the normal flow, if the user inputs Weight Property in a wrong format.<br>1. The system shows the error message about the Weight Property is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 4 of the normal flow, if the user inputs Iconicity in a wrong format.<br>1. The system shows the error message about the Iconicity is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In all of step of the normal flow, if the system disconnects from an internet.<br>1. The system shows the error message about internet disconnection. |
| **Include:** | URS-24 |

URS 12: System requirement specification (SRS)

| **No** | **System requirement specification (SRS)** |
|---|---|
| SRS-123 | The system provides the Graphic user interface (GUI) which receive substance name, Water Solubility Property, Stability Property, Dissolution Property, Partition Coefficient Property, Physical Form Property, Hygroscopicity Property, Particle Property, Alcohol Solubility Property, Flow ability Property, Powder Density Property, Salt Property, Weight Property and Iconicity. |
| SRS-124 | The system can check the substance name format. The substance name format should be the character. |
| SRS-125 | The system can check the Water Solubility Property format. The Water Solubility Property format should be the character. |
| SRS-126 | The system can check the Stability Property format. The Stability Property format should be the character. |
| SRS-127 | The system can check the Dissolution Property format. The Dissolution Property format should be the character. |
| SRS-128 | The system can check the Partition Coefficient Property format. The Partition Coefficient Property format should be the character. |
| SRS-129 | The system can check the Physical Form Property format. The Physical Form Property format should be the character. |
| SRS-130 | The system can check the Hygroscopicity Property format. The Hygroscopicity Property format should be the character. |
| SRS-131 | The system can check the Particle Property format. The Particle Property format should be the character. |
| SRS-132 | The system can check the Alcohol Solubility Property format. The Alcohol Solubility Property format should be the character. |

| | |
|---|---|
| SRS-133 | The system can check the Flow ability Property format. The Flow ability Property format should be the character. |
| SRS-134 | The system can check the Powder Density Property format. The Powder Density Property format should be the character. |
| SRS-135 | The system can check the Salt Property format. The Salt Property format should be the float value. |
| SRS-136 | The system can check the Weight Property format. The Weight Property format should be float value. |
| SRS-137 | The system can check the Iconicity format. The Iconicity format should be the character. |
| SRS-138 | The system save the substance to the system. |
| SRS-139 | The system shall show the successful add a new substance page. |
| SRS-140 | The system shall display the error message “The substance name should be the characters.” |
| SRS-141 | The system shall display the error message “The Water Solubility Property should be the characters.” |
| SRS-142 | The system shall display the error message “The Stability Property should be the characters.” |
| SRS-143 | The system shall display the error message “The Dissolution Property should be the characters.” |
| SRS-144 | The system shall display the error message “The Partition Coefficient should be the characters.” |
| SRS-145 | The system shall display the error message “The Physical Form Property should be the characters.” |
| SRS-146 | The system shall display the error message “The Hygroscopicity Property should be the characters.” |
| SRS-147 | The system shall display the error message “The Particle Property should be the characters.” |
| SRS-148 | The system shall display the error message “The Alcohol Solubility Property should be the characters.” |
| SRS-149 | The system shall display the error message “The Flow ability Property should be the characters.” |
| SRS-150 | The system shall display the error message “The Powder Density Property should be the characters.” |
| SRS-151 | The system shall display the error message “The Salt Property should be the float value.” |
| SRS-152 | The system shall display the error message “The Weight Property should be the float value.” |
| SRS-153 | The system shall display the error message “The Iconicity should be the characters.” |
| SRS-12 | The system shall display the error message “The system is disconnect from the internet”. |

## URS-13: The user updates an existing substance in the system.

### Description

| | | | |
|---|---|---|---|
| **User Requirement Specification ID:** | URS-13 | | |
| **User Requirement Specification Name:** | The user updates an existing substance in the system. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 7, 2014 | **Last Revision Date :** | April 7, 2014 |
| **Actor:** | Expert Pharmacists, Administrator | | |
| **Description:** | URS-13 is used, when the user wants to update the existing substance in the system. | | |
| **Trigger:** | The user selects "Update the existing substance" for updating the existing substance in the system. | | |
| **Pre-condition:** | • The user must log into the system. | | |
| **Post-condition:** | • The systems saves the substance updating to the system. | | |

| **Input data** | Part | Input Name | Example | Description |
|---|---|---|---|---|
| | Substance's name | Name | "Aplo" | The word should be the character. |
| | Water Solubility Property | Type | "SlightlySoluble" | The value should be the integer value. |
| | Stability Property | Degradation Mechanism | "Oxidation" | The word should be the character. |
| | | Kinetic Reaction | "FirstOrderKinetics" | The word should be the character. |
| | Dissolution Property | Type | "Weak" | The word should be the character. |
| | Partition Coefficient Property | Type | "GoodAbsorbtion" | The word should be the character. |
| | Physical Form Property | Type | "CrystallineMaterials" | The word should be the character. |
| | Hygroscopicity Property | Type | "Slightly hygroscopic" | The word should be the character. |
| | Particle Property | Type | "MicronizedParticle" | The word should be the character. |
| | Alcohol Solubility Property | Type | "FreelySoluble" | The word should be the character. |
| | Flow ability Property | Type | "ExcellentFlowability" | The word should be the character. |
| | Powder Density Property | Type | "TrueIdentity" | The word should be the character. |
| | Salt Property | Pka | "Very weak" | The word should be the character. |

| | | | | |
|---|---|---|---|---|
| | | Molecular weight | 2.57 | The value should be the float value. |
| | Weight Property | Value | 2.55 | The value should be the float value. |
| | Iconicity | Type | “good” | The word should be the character. |

**Normal Flow:**

1. The user opens updating the existing substance in the system.
2. The user selects the substance from a list of substance name.
3. The user inputs the substance name, Water Solubility Property, Stability Property, Dissolution Property, Partition Coefficient Property, Physical Form Property, Hygroscopicity Property, Particle Property, Alcohol Solubility Property, Flow ability Property,Powder Density Property, Salt Property, Weight Property and Iconicity.
4. The user selects “confirm to update” for update the existing substance in the system.
5. The system validates the input value.
6. The system update the existing substance to the system.
7. The system shows the existing substance updating successful page.

**Alternative Flow:**

- In step 2 of the normal flow, if the user uses search bar for searching the existing substance by the substance name instead of selecting the existing substance in a list.
  1. The user inputs the substance name in the search bar.
  2. The user selects “searching” for searching the existing drug formulation in the system.
  3. The system shows the substance.
  4. The step of this use case is resumed at a step 3 of the normal flow.

- In the step 4 of the normal flow, if the user selects “cancel” instead of selecting “confirm to update”.
  1 The system resume at the step 3 of the normal flow.

**Exception:**

- In step 4 of the normal flow, if the user inputs the substance name that same as other substance name in the system.
  1. The system shows the error message about the substance name is already used.
  2. The user go back to do the step 2 of the normal flow again.

- In step 4 of the normal flow, if the user inputs the Water Solubility Property in a wrong format.
  1. The system shows the error message about the Water Solubility Property format is wrong.
  2. The user go back to do the step 2 of the normal flow again.

- In step 4 of the normal flow, if the user inputs Stability Property in a wrong format.
  1. The system shows the error message about the Stability Property is wrong.
  2. The user go back to do the step 2 of the normal flow again.

- In step 4 of the normal flow, if the user inputs Dissolution Property in a wrong format.
  1. The system shows the error message about the Dissolution Property is wrong.
  2. The user go back to do the step 2 of the normal flow again.

- In step 4 of the normal flow, if the user inputs Partition Coefficient Property in a wrong format.
  1 The system shows the error message about the Partition Coefficient is wrong.
  2 The user go back to do the step 2 of the normal flow again.

- In step 4 of the normal flow, if the user inputs Physical Form Property in a wrong format.
  1. The system shows the error message about the Physical Form Property is wrong.
  2. The user go back to do the step 2 of the normal flow again.

- In step 4 of the normal flow, if the user inputs Hygroscopicity Property in a wrong format.
  1. The system shows the error message about the Hygroscopicity Property is wrong.
  2. The user go back to do the step 2 of the normal flow again.

- In step 4 of the normal flow, if the user inputs Particle Property in a wrong format.
  1. The system shows the error message about the Particle Property is wrong.
  2. The user go back to do the step 2 of the normal flow again.

- In step 4 of the normal flow, if the user inputs Alcohol Solubility Property in a wrong format.
  1. The system shows the error message about the Alcohol Solubility is wrong.
  2. The user go back to do the step 2 of the normal flow again.

- In step 4 of the normal flow, if the user inputs Flow ability Property in a wrong format.
  1. The system shows the error message about the Flow ability Property is wrong.
  2. The user go back to do the step 2 of the normal flow again.

- In step 4 of the normal flow, if the user inputs Powder Density Property in a wrong format.
  1. The system shows the error message about the Powder Density is wrong.
  2. The user go back to do the step 2 of the normal flow again.

- In step 4 of the normal flow, if the user inputs Salt Property in a wrong format.

| | |
|---|---|
| | 1. The system shows the error message about the Salt Property is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 4 of the normal flow, if the user inputs Weight Property in a wrong format.<br>1. The system shows the error message about the Weight Property is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 4 of the normal flow, if the user inputs Iconicity in a wrong format.<br>1. The system shows the error message about the Iconicity is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In all of steps of the normal flow, if the system disconnects from an internet.<br>1. The system shows the error message about internet disconnection. |
| **Include:** | URS-24 |

URS 13: System requirement specification (SRS)

| No | System requirement specification (SRS) |
|---|---|
| SRS-123 | The system provides the Graphic user interface (GUI) which receive substance name, Water Solubility Property, Stability Property, Dissolution Property, Partition Coefficient Property, Physical Form Property, Hygroscopicity Property, Particle Property, Alcohol Solubility Property, Flow ability Property, Powder Density Property, Salt Property, Weight Property and Iconicity. |
| SRS-154 | The system shows the list of the existing substance in the system. |
| SRS-155 | The system provides the search bar for searching the list of substance. The search bar uses the name of substance for searching. |
| SRS-124 | The system can check the substance name format. The substance name format should be the character. |
| SRS-125 | The system can check the Water Solubility Property format. The Water Solubility Property format should be the character. |
| SRS-126 | The system can check the Stability Property format. The Stability Property format should be the character. |
| SRS-127 | The system can check the Dissolution Property format. The Dissolution Property format should be the character. |
| SRS-128 | The system can check the Partition Coefficient Property format. The Partition Coefficient Property format should be the character. |
| SRS-129 | The system can check the Physical Form Property format. The Physical Form Property format should be the character. |
| SRS-130 | The system can check the Hygroscopicity Property format. The Hygroscopicity Property format should be the character. |

| | |
|---|---|
| SRS-131 | The system can check the Particle Property format. The Particle Property format should be the character. |
| SRS-132 | The system can check the Alcohol Solubility Property format. The Alcohol Solubility Property format should be the character. |
| SRS-133 | The system can check the Flow ability Property format. The Flow ability Property format should be the character. |
| SRS-134 | The system can check the Powder Density Property format. The Powder Density Property format should be the character. |
| SRS-135 | The system can check the Salt Property format. The Salt Property format should be the float value. |
| SRS-136 | The system can check the Weight Property format. The Weight Property format should be float value. |
| SRS-137 | The system can check the Iconicity format. The Iconicity format should be the character. |
| SRS-156 | The system update the existing substance that selected by the user. |
| SRS-157 | The system shall show the successful the existing substance updating page. |
| SRS-140 | The system shall display the error message “The substance name should be the characters.” |
| SRS-141 | The system shall display the error message “The Water Solubility Property should be the characters.” |
| SRS-142 | The system shall display the error message “The Stability Property should be the characters.” |
| SRS-143 | The system shall display the error message “The Dissolution Property should be the characters.” |
| SRS-144 | The system shall display the error message “The Partition Coefficient should be the characters.” |
| SRS-145 | The system shall display the error message “The Physical Form Property should be the characters.” |
| SRS-146 | The system shall display the error message “The Hygroscopicity Property should be the characters.” |
| SRS-147 | The system shall display the error message “The Particle Property should be the characters.” |
| SRS-148 | The system shall display the error message “The Alcohol Solubility Property should be the characters.” |
| SRS-149 | The system shall display the error message “The Flow ability Property should be the characters.” |
| SRS-150 | The system shall display the error message “The Powder Density Property should be the characters.” |
| SRS-151 | The system shall display the error message “The Salt Property should be the float value.” |
| SRS-152 | The system shall display the error message “The Weight Property should be the float value.” |
| SRS-153 | The system shall display the error message “The Iconicity should be the characters.” |
| SRS-12 | The system shall display the error message “The system is disconnect from the internet.” |

### URS-14: The user deletes an existing substance into the system.

Description

| | | | |
|---|---|---|---|
| **User Requirement Specification ID:** | URS-14 | | |
| **User Requirement Specification Name:** | The user deletes an existing substance into the system. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 7, 2014 | **Last Revision Date :** | April 7, 2014 |
| **Actor:** | Expert Pharmacists, Administrator | | |
| **Description:** | URS-14 is used, when the user wants to delete the existing substance from the system. | | |
| **Trigger:** | The user selects "delete the existing substance" for deleting the existing substance from the system. | | |
| **Pre-condition:** | • The user must log into the system. | | |
| **Post-condition:** | • The system deletes the substance from the system. | | |
| **Input data** | Input name | Example | Description |
| | Substance name | "Aplo" | The substance name should be the character. |
| **Normal Flow:** | 1. The user opens deleting the existing substance page.<br>2. The user selects existing substance from the list.<br>3. The user selects "confirm to delete" for deleting the existing substance from the system.<br>4. The system shows the alert message for checking the drug substance deleting.<br>5. The administrator selects "Yes" for confirming to delete the member account.<br>6. The system deletes the existing substance from the system.<br>7. The system shows deleting the existing substance successful page. | | |
| **Alternative Flow:** | • In step 2 of the normal flow, if the user uses search bar for searching the existing substance by the substance name instead of selecting the existing substance in a list.<br>1. The user inputs the substance name in the search bar.<br>2. The user selects "searching" for searching the existing drug formulation in the system.<br>3. The system shows the substance.<br>4. The step of this use case is resumed at step 3 of the normal flow.<br>• In the step 3 of the normal flow, if the user selects "cancel" instead of selecting "Yes".<br>1. The system shows the main page of the program. | | |
| **Exception:** | • In all of step of the normal flow, if the system disconnects from an internet.<br>1. The system shows the error message about internet disconnection. | | |
| **Include:** | URS-24 | | |

URS 14: System requirement specification (SRS)

| No | System requirement specification (SRS) |
|---|---|
| SRS-154 | The system shows the list of the existing substance in the system. |
| SRS-155 | The system provides the search bar for searching the list of substance. The search bar use the name of substance for searching. |
| SRS-158 | The system shows the Confirm dialog box (YES/NO option). The confirm box use for confirming the substance deleting. |
| SRS-159 | The system delete the existing substance from the system. |
| SRS-160 | The system shall show the successful delete the existing substance page. |
| SRS-12 | The system shall display the error message “The system is disconnect from the internet”. |

## URS-15: The user views the substance in the system.

### Description

| | | | |
|---|---|---|---|
| **User Requirement Specification ID:** | URS-15 | | |
| **User Requirement Specification Name:** | The user views the substance in the system. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 2, 2014 | **Last Revision Date :** | April 2, 2014 |
| **Actor:** | General Pharmacists, Expert Pharmacists, Administrator | | |
| **Description:** | URS-15 is used, when the user wants to view the substance of a drug. | | |
| **Trigger:** | The user selects "view the substance" to view the substance of the drug. | | |
| **Pre-condition:** | • The user must log into the system. | | |
| **Post-condition:** | • N/A | | |
| **Normal Flow:** | 1. The user opens the drug substance page.<br>2. The system shows a list of a drug substance name.<br>3. The user selects the name of drug reformulation that they want to see a detail.<br>4. The system shows a detail of the history that the user selected. | | |
| **Alternative Flow:** | • In step 3 of the normal flow, if the user use search bar for searching the substance by name instead of selecting the substance in a list.<br>1. The user inputs the name into the search bar.<br>2. The user selects "submit" for searching a substance by name.<br>3. The system shows the list of substance. | | |
| **Exception:** | • In all of step of the normal flow, if the system disconnects from an internet<br>1. The system shows the error message about internet disconnection. | | |
| **Include:** | URS-24 | | |

### URS 15: System requirement specification (SRS)

| **No** | **System requirement specification (SRS)** |
|---|---|
| SRS-154 | The system shows the list of drug substance. |
| SRS-155 | The system provides the search bar for searching the drug substance. The search bar use the name of substance to searching. |
| SRS-161 | The system shows the detail of the substance. The substance detail include the substance name, Water Solubility Property, Stability Property, Dissolution Property, Partition Coefficient Property, Physical Form Property, Hygroscopicity Property, Particle Property, Alcohol Solubility Property, Flow ability Property, Powder Density Property, Salt Property, Weight Property and Iconicity. . |
| SRS-19 | The system shall display the error message "The system is disconnect from the internet". |

## Use case7: Manage the drug excipient.

### URS-16: The user adds a new drug excipient to the system.

Description

| | | | |
|---|---|---|---|
| **User Requirement Specification ID:** | URS-16 | | |
| **User Requirement Specification Name:** | The user adds a new drug excipient to the system. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 7, 2014 | **Last Revision Date :** | April 7, 2014 |
| **Actor:** | Expert Pharmacists, Administrator | | |
| **Description:** | URS-16 is used, when the user wants to add a new excipient into the system. | | |
| **Trigger:** | The user selects "Add a new drug excipient" for adding a new drug excipient into the system. | | |
| **Pre-condition:** | • The user must log into the system. | | |
| **Post-condition:** | • The system saves the new drug excipient into the system. | | |
| **Input data** | **Input Name** | **Example** | **Description** |
| | Substance Name | "Lexapro" | The word should be the character. |
| | Substance Role | "Binder" | The list substance role should be the characters |
| | Max Concentration | 2.40 | The max concentration should be the float number. |
| | Min Concentration | 3.67 | The min concentration should be the float number. |
| **Normal Flow:** | 1. The user opens add new drug excipient page.<br>2. The user inputs Substance name, Substance role, Max Concentration and Min Concentration.<br>3. The user selects "save" for saving a new drug excipient into the system.<br>4. The system validates the input data.<br>5. The system saves a new drug excipient to the system.<br>6. The system shows a new drug excipient successful page. | | |
| **Alternative Flow:** | In the step 3 of the normal flow, if the user select "cancel" instead of selecting "save".<br>1. The system shows the administrator main page. | | |
| **Exception:** | • In all of step of the normal flow, if the system disconnects from an internet<br>1. The system shows the error message about internet disconnection.<br><br>• In step 4 of the normal flow, if the user input the drug substance name in a wrong format.<br>1. The system shows the error message about the substance name format is wrong. | | |

| | |
|---|---|
| | 2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 4 of the normal flow, if the user input the drug substance role in a wrong format.<br>1. The system shows the error message about the substance role format is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 4 of the normal flow, if the user input the max concentration in a wrong format.<br>1. The system shows the error message about the max concentration Intensity format is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 4 of the normal flow, if the user input the min concentration in a wrong format.<br>3. The system shows the error message about the min concentration format is wrong.<br>The user go back to do the step 2 of the normal flow again. |
| **Include:** | URS-20 |

URS 16: System requirement specification (SRS)

| **No** | **System requirement specification (SRS)** |
|---|---|
| SRS-162 | The system provides the Graphic user interface (GUI) which receive the substance name, substance role, max concentration and min concentration. |
| SRS-163 | The system can check the substance name format. The substance name format should be the characters. |
| SRS-164 | The system can check the substance role format. The substance role format should be the characters. |
| SRS-165 | The system can check the max concentration format. The max concentration format should be the float number. |
| SRS-166 | The system can check the min concentration format. The min concentration format should be the float number. |
| SRS-167 | The system save the new drug excipient to the system. |
| SRS-168 | The system shall show the successful add a new drug excipient page. |
| SRS-169 | The system shall display the error message “The excipient name is not the characters”. |
| SRS-170 | The system shall display the error message “The substance role is not the characters”. |
| SRS-171 | The system shall display the error message “The max concentration is not the float number”. |
| SRS-172 | The system shall display the error message “The min concentration is not the float number”. |
| SRS-12 | The system shall display the error message “The system is disconnect from the internet”. |

## URS-17: The user update an existing drug excipient in the system.

### Description

| | | | |
|---|---|---|---|
| **User Requirement Specification ID:** | URS-17 | | |
| **User Requirement Specification Name:** | The user updates an existing drug excipient in the system. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 7, 2014 | **Last Revision Date :** | May 25, 2014 |
| **Actor:** | Expert Pharmacists, Administrator | | |
| **Description:** | URS-17 is used, when the user updates an existing drug excipient in the system. | | |
| **Trigger:** | The user selects "update an existing drug excipient" to update an existing drug excipient in the system. | | |
| **Pre-condition:** | • The user must log into the system. | | |
| **Post-condition:** | • The system saves the drug excipient updating into the system. | | |
| **Input data** | **Input Name** | **Example** | **Description** |
| | Substance Role | "Solvent", "Vehicle" | The list of substance role should be the characters |
| | Max Concentration | 5.89 | The max concentration should be the float number. |
| | Min Concentration | 3.67 | The min concentration should be the float number. |
| **Normal Flow:** | 1. The user opens the drug excipient updating page.<br>2. The user selects an existing drug excipient from a list for updating.<br>3. The user inputs a new data for updating such as Substance role, max concentration and min concentration.<br>4. The user selects "confirm to update" for update an existing drug excipient.<br>5. The system validates the input data.<br>6. The system update the existing drug excipient.<br>7. The system shows the existing drug excipient updating successful page. | | |
| **Alternative Flow:** | • In step 2 of the normal flow, if the user uses search bar for searching the existing drug excipient by the substance name instead of selecting the existing drug substance in a list.<br>1. The user inputs the substance name in a search bar.<br>2. The user selects "searching" for searching the existing drug excipient in the system.<br>3. The system shows the drug formulation.<br>4. The step of this use case is resumed at step 3 of the normal flow.<br><br>• In the step 3 of the normal flow, if the user select "cancel" instead of selecting "confirm to update".<br>1. The system shows the administrator main page. | | |

| | |
|---|---|
| **Exception:** | • In all of step of the normal flow, if the system disconnects from an internet<br>1. The system shows the error message about internet disconnection.<br><br>• In step 5 of the normal flow, if the user inputs the drug substance role in a wrong format.<br>1. The system shows the error message about the substance role format is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 5 of the normal flow, if the user inputs the max concentration in a wrong format.<br>1. The system shows the error message about the max concentration format is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 5 of the normal flow, if the user inputs the min concentration in a wrong format.<br>1. The system shows the error message about the min concentration format is wrong.<br>2. The user go back to do the step 2 of the normal flow again |
| **Include:** | URS-24 |

### URS 17: System requirement specification (SRS)

| **No** | **System requirement specification (SRS)** |
|---|---|
| SRS-162 | The system provides the Graphic user interface (GUI) which receive substance role, max concentration and min concentration. |
| SRS-173 | The system shows the list of drug formulation. |
| SRS-174 | The system provides the search bar for searching the list of drug excipient. The search bar uses the name of substance for searching. |
| SRS-164 | The system can check the substance role format. The substance role format should be the characters. |
| SRS-165 | The system can check the max concentration format. The max concentration format should be the float number. |
| SRS-166 | The system can check the max concentration format. The min concentration format should be the float number. |
| SRS-175 | The system update drug excipient |
| SRS-176 | The system shall show the successful update existing drug excipient page. |
| SRS-170 | The system shall display the error message “The substance role is not the characters”. |
| SRS-171 | The system shall display the error message “The max concentration is not the float number”. |
| SRS-172 | The system shall display the error message “The min concentration is not the float number”. |

| | |
|---|---|
| SRS-12 | The system shall display the error message “The system is disconnect from the internet”. |

### URS-18: The user deletes an existing drug excipient in the system.

Description

| | | | |
|---|---|---|---|
| **User Requirement Specification ID:** | URS-18 | | |
| **User Requirement Specification Name:** | The user deletes an existing drug excipient in the system. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 7, 2014 | **Last Revision Date :** | April 7, 2014 |
| **Actor:** | Expert Pharmacists, Administrator | | |
| **Description:** | URS-18 is used, when the user wants to delete the existing drug excipient from the system. | | |
| **Trigger:** | The user selects “Delete the existing drug excipient” to delete a drug excipient from the system. | | |
| **Pre-condition:** | • The user must log into the system. | | |
| **Post-condition:** | • The system deletes the existing drug excipient from the system. | | |
| **Input data** | Input name | Example | Description |
| | Substance name | “Lexapro” | The substance name should be the characters. |
| **Normal Flow:** | 1. The user opens the existing drug excipient deleting page.<br>2. The user selects the substance name from the list.<br>3. The user selects “delete” for delete the existing drug excipient from the system.<br>4. The system shows the alert message for checking the drug excipient deleting.<br>5. The administrator selects “Yes” for confirming to delete the drug excipient.<br>6. The system deletes the existing drug excipient form the system.<br>7. The system shows the existing drug excipient deleting successful page. | | |
| **Alternative Flow:** | • In the step 3 of the normal flow, if the user selects “cancel” instead of selecting “Yes”.<br>1. The system shows the administrator main page.<br><br>• In step 2 of the normal flow, if the user uses search bar for searching the existing drug excipient by the substance name instead of selecting the existing drug excipient in a list.<br>1. The user inputs the substance name in a search bar.<br>2. The user selects “searching” for searching the existing drug excipient in the system.<br>3. The system shows the drug excipient.<br>4. The step of this use case is resume at a step 3 of the normal flow. | | |

| | |
|---|---|
| **Exception:** | • In all of step of the normal flow, if the system disconnects from an internet<br>1. The system shows the error message about internet disconnection. |
| **Include:** | URS-20 |

URS 18: System requirement specification (SRS)

| **No** | **System requirement specification (SRS)** |
|---|---|
| SRS-173 | The system shows the list of drug excipient. |
| SRS-174 | The system provides the search bar for searching the list of drug excipient. The search bar use the name of substance for searching. |
| SRS-177 | The system shows the Confirm dialog box (YES/NO option).For making confirm when the administrator want to delete the existing drug excipient. |
| SRS-178 | The system deletes the drug excipient from the system. |
| SRS-179 | The system shall show the successful delete existing drug excipient case page. |
| SRS-12 | The system shall display the error message “The system is disconnect from the internet”. |

## URS-19: The user views all of the excipient in the system.

### Description

| | | | |
|---|---|---|---|
| **User Requirement Specification ID:** | URS-19 | | |
| **User Requirement Specification Name:** | The user views all the excipient in the system. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 2, 2014 | **Last Revision Date :** | April 2, 2014 |
| **Actor:** | General Pharmacists, Expert Pharmacists, Administrator | | |
| **Description:** | URS-18 is used, when the user wants to view the excipient of a drug. | | |
| **Trigger:** | The user selects "view the formulation" to view the excipient of the drug. | | |
| **Pre-condition:** | • The user must log into the system. | | |
| **Post-condition:** | • N/A | | |
| **Normal Flow:** | 1. The user opens the viewing drug excipient page.<br>2. The system shows a list of a drug excipient name.<br>3. The user selects the name of drug excipient that they want to see a detail.<br>4. The system shows a detail of the drug excipient that the user selected. | | |
| **Alternative Flow:** | • In step 3 of the normal flow, if the user uses search bar for searching the excipient by substance name instead of selecting the excipient in a list.<br>1. The user inputs the substance name into the search bar.<br>2. The user selects "submit" for searching the excipient by substance name.<br>3. The system shows the list of drug excipient. | | |
| **Exception:** | • In all of step of the normal flow, if the system disconnects from an internet.<br>1. The system shows the error message about internet disconnection. | | |
| **Include:** | URS-24 | | |

### URS 19: System requirement specification (SRS)

| No | System requirement specification (SRS) |
|---|---|
| SRS-173 | The system shows the list of drug excipient. |
| SRS-174 | The system provides the search bar for searching the drug excipient. The search bar uses the name of substance to searching. |
| SRS-180 | The system shows the detail of the formulation .the substance name, substance role, max concentration and min concentration. |
| SRS-12 | The system shall display the error message "The system is disconnect from the internet". |

## Use case8: Manage the drug formulation.

### URS-20: The user adds a new drug formulation case into the system.

Description

| | | | |
|---|---|---|---|
| **User Requirement Specification ID:** | URS-20 | | |
| **User Requirement Specification Name:** | The user adds a new drug formulation case into the system. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 7, 2014 | **Last Revision Date :** | April 7, 2014 |
| **Actor:** | Expert Pharmacists, Administrator | | |
| **Description:** | URS-20 is used, when the user wants to add a new reformulation case into the system for using with case base reasoning system. | | |
| **Trigger:** | The user selects "Add a new drug formulation" for adding a new drug formulation into the system. | | |
| **Pre-condition:** | • The user must log into the system. | | |
| **Post-condition:** | • The system saves the new drug reformulation case into the system. | | |
| **Input data** | **Input Name** | **Example** | **Description** |
| | Drug name | "Lexapro" | The word should be the character. |
| | Excipient name | talc, croscarmellose sodium, microcrystalline cellulose/colloidal, silicon dioxide and magnesium | The list of excipient should be the character. |
| | Excipient Role | Diluent, antiadherent, Libran, disintegrant | The list of excipient role should be the character. |
| | Excipient Intensity | 5.34 | The value of a excipient Intensity should be the float number |
| | Excipient Quantity | 6.34 | The value of a excipient quantity should be the float number. |
| **Normal Flow:** | 1. The user opens add new drug reformulation case page.<br>2. The user inputs drug name, excipient name, excipient role, excipient intensity and excipient quantity.<br>3. The user selects "save" for saving a new drug formation into the system.<br>4. The system validates the input data.<br>5. The system saves a new drug formulation to the system.<br>6. The system shows a new drug formulation case successful page. | | |
| **Alternative Flow:** | In the step 3 of the normal flow, if the user select "cancel" instead of selecting "save". | | |

| | |
|---|---|
| | 1. The system shows the administrator main page. |
| **Exception:** | • In all of step of the normal flow, if the system disconnects from an internet<br>1. The system shows the error message about internet disconnection.<br><br>• In step 4 of the normal flow, if the user input the drug excipient name in a wrong format.<br>1. The system shows the error message about the drug excipient name format is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 4 of the normal flow, if the user input the drug excipient role in a wrong format.<br>1. The system shows the error message about the drug excipient role format is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 4 of the normal flow, if the user input the excipient intensity in a wrong format.<br>1. The system shows the error message about the excipient intensity format is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 4 of the normal flow, if the user input the excipient quantity in a wrong format.<br>1. The system shows the error message about the excipient quantity format is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 4 of the normal flow, if the user input the drug name that same as with other drug name in the system.<br>1. The system shows the error message about the drug name is already used.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 4 of the normal flow, if the user input the drug name that in the wrong format.<br>1. The system shows the error message about the drug name is wrong format.<br>2. The user go back to do the step 2 of the normal flow again. |
| **Include:** | URS-24 |

URS 20: System requirement specification (SRS)

| No | System requirement specification (SRS) |
|---|---|
| SRS-181 | The system provides the Graphic user interface (GUI) which receive the drug name, excipient name, excipient role, excipient quantity and excipient intensity. |
| SRS-182 | The system can check the drug name format. The drug name format should be the characters. |
| SRS-183 | The system can check the excipient name format. The excipient name format should be the characters |
| SRS-184 | The system can check the excipient role format. The excipient role format should be the characters. |
| SRS-185 | The system can check the excipient quantity format. The excipient quantity format should be the float number. |
| SRS-186 | The system can check the excipient Intensity format. The excipient Intensity format should be the float number. |
| SRS-187 | The system save the drug formulation to the system. |
| SRS-188 | The system shall show the successful add a new drug formulation page. |
| SRS-189 | The system shall display the error message “The drug name is not the characters”. |
| SRS-190 | The system shall display the error message “The excipient name is not the characters”. |
| SRS-191 | The system shall display the error message “The excipient role is not the characters”. |
| SRS-192 | The system shall display the error message “The excipient quantity is not the float number”. |
| SRS-193 | The system shall display the error message “The excipient intensity is not the float number”. |
| SRS-194 | The system shall display the error message “The drug name is already used”. |
| SRS-12 | The system shall display the error message “The system is disconnect from the internet”. |

URS-21: The user update an existing drug formulation case in the system.

Description

| | | | |
|---|---|---|---|
| **User Requirement Specification ID:** | URS-21 | | |
| **User Requirement Specification Name:** | The user updates an existing drug formulation case in the system. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 7, 2014 | **Last Revision Date :** | May 25, 2014 |
| **Actor:** | Expert Pharmacists, Administrator | | |
| **Description:** | URS-21 is used, when the user updates an existing drug reformulation case in the system. | | |
| **Trigger:** | The user selects "update an existing drug formulation case" to update an existing case in the system. | | |
| **Pre-condition:** | • The user must log into the system. | | |
| **Post-condition:** | • The system saves the drug reformulation updating into the system. | | |
| **Input data** | **Input Name** | **Example** | **Description** |
| | Excipient name | talc, croscarmellose sodium, microcrystalline cellulose/colloidal, silicon dioxide and magnesium | The list of substance should be the character. |
| | Excipient Role | Diluent, antiadherent, Libran, disintegrant | The list of substance role should be the character. |
| | Excipient Intensity | 5.34 | The value of a substance Intensity should be the float number |
| | Excipient Quantity | 4.55 | The value of a substance quantity should be the float number |
| **Normal Flow:** | 1. The user opens the drug reformulation updating page.<br>2. The user selects an existing drug reformulation from a list for updating.<br>3. The user inputs a new data for updating such as excipient name, excipient role, excipient intensity and excipient quantity.<br>4. The user selects "confirm to update" for update an existing drug reformulation.<br>5. The system validates the input data.<br>6. The system update the existing drug formulation.<br>7. The system shows the existing drug reformulation updating successful page. | | |
| **Alternative Flow:** | • In step 2 of the normal flow, if the user uses search bar for searching the existing drug formulation by the drug's name instead of selecting the existing drug formulation in a list.<br>1. The user inputs the drug name in a search bar. | | |

| | |
|---|---|
| | 2. The user selects “searching” for searching the existing drug formulation in the system.<br>3. The system shows the drug formulation.<br>4. The step of this use case is resumed at step 3 of the normal flow.<br><br>• In the step 3 of the normal flow, if the user select “cancel” instead of selecting “confirm to update”.<br>1. The system shows the administrator main page. |
| **Exception:** | • In all of step of the normal flow, if the system disconnects from an internet<br>1. The system shows the error message about internet disconnection.<br><br>• In step 5 of the normal flow, if the user inputs the drug excipient name in a wrong format.<br>1. The system shows the error message about the drug excipient name format is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 5 of the normal flow, if the user inputs the drug excipient role in a wrong format.<br>1. The system shows the error message about the excipient role format is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 5 of the normal flow, if the user inputs the excipient intensity in a wrong format.<br>1. The system shows the error message about the excipient Intensity format is wrong.<br>2. The user go back to do the step 2 of the normal flow again.<br><br>• In step 5 of the normal flow, if the user inputs the excipient quantity in a wrong format.<br>1. The system shows the error message about the excipient quantity format is wrong.<br>2. The user go back to do the step 2 of the normal flow again |
| **Include:** | URS-24 |

URS 21: System requirement specification (SRS)

| No | System requirement specification (SRS) |
|---|---|
| SRS-195 | The system provides the Graphic user interface (GUI) which receive excipient name, excipient role, excipient quantity, excipient intensity. |
| SRS-196 | The system shows the list of drug formulation. |
| SRS-197 | The system provides the search bar for searching the list of drug formulation. The search bar uses the name of drug for searching. |
| SRS-183 | The system can check the substance type format. The excipient name format should be the characters. |
| SRS-184 | The system can check the substance role format. The excipient role format should be the characters. |
| SRS-185 | The system can check the substance quantity format. The excipient quantity format should be the float number. |
| SRS-186 | The system can check the substance Intensity format. The excipient intensity format should be the float number. |
| SRS-198 | The system update drug formation that selected by the administrator. |
| SRS-199 | The system shall show the successful update existing drug formulation case page. |
| SRS-190 | The system shall display the error message “The excipient name is not the characters”. |
| SRS-191 | The system shall display the error message “The excipient role is not the characters”. |
| SRS-192 | The system shall display the error message “The excipient quantity is not the float number”. |
| SRS-193 | The system shall display the error message “The excipient intensity is not the float number”. |
| SRS-12 | The system shall display the error message “The system is disconnect from the internet”. |

URS-22: The user deletes an existing drug formulation case in the system.

Description

| | | | |
|---|---|---|---|
| **User Requirement Specification ID:** | URS-22 | | |
| **User Requirement Specification Name:** | The user deletes an existing drug formulation case in the system. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 7, 2014 | **Last Revision Date :** | April 7, 2014 |
| **Actor:** | Expert Pharmacists, Administrator | | |
| **Description:** | URS-22 is used, when the user wants to delete the existing drug formulation case from the system. | | |
| **Trigger:** | The user selects "Delete the existing drug formulation" to delete a drug formulation case from the system. | | |
| **Pre-condition:** | • The user must log into the system. | | |
| **Post-condition:** | • The system deletes the existing drug formulation from the system. | | |
| **Input data** | Input name | Example | Description |
| | Drug formulation's name | "Lexapro" | The drug formulation's name should be the characters. |
| **Normal Flow:** | 1. The user opens the existing drug formulation deleting page.<br>2. The user selects the drug name from the list.<br>3. The user selects "delete" for delete the existing formulation from the system.<br>4. The system shows the alert message for checking the drug substance deleting.<br>5. The administrator selects "Yes" for confirming to delete the drug formulation.<br>6. The system deletes the existing drug formulation form the system.<br>7. The system shows the existing drug formulation deleting successful page. | | |
| **Alternative Flow:** | • In the step 3 of the normal flow, if the user selects "cancel" instead of selecting "Yes".<br>1. The system shows the administrator main page.<br><br>• In step 2 of the normal flow, if the user uses search bar for searching the existing drug formulation by the drug's name instead of selecting the existing drug formulation in a list.<br>1. The user inputs the drug name in a search bar.<br>2. The user selects "searching" for searching the existing drug formulation in the system.<br>3. The system shows the drug formulation.<br>4. The step of this use case is resume at a step 3 of the normal flow. | | |
| **Exception:** | • In all of step of the normal flow, if the system disconnects from an internet<br>1. The system shows the error message about internet disconnection. | | |
| **Include:** | URS-24 | | |

URS 22: System requirement specification (SRS)

| No | System requirement specification (SRS) |
|---|---|
| SRS-196 | The system shows the list of drug formulation. |
| SRS-197 | The system provides the search bar for searching the list of drug formulation. The search bar use the name of drug for searching. |
| SRS-200 | The system shows the Confirm dialog box (YES/NO option).For making confirm when the administrator want to delete the existing drug formulation. |
| SRS-201 | The system deletes the drug formulation from the system. |
| SRS-202 | The system shall show the successful delete existing drug formulation case page. |
| SRS-12 | The system shall display the error message “The system is disconnect from the internet”. |

## URS-23: The user views all of the formulation in the system.

### Description

| | | | |
|---|---|---|---|
| **User Requirement Specification ID:** | URS-19 | | |
| **User Requirement Specification Name:** | The user views all the formulation in the system. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 2, 2014 | **Last Revision Date :** | April 2, 2014 |
| **Actor:** | General Pharmacists, Expert Pharmacists, Administrator | | |
| **Description:** | URS-23 is used, when the user wants to view the formulation of a drug. | | |
| **Trigger:** | The user selects "view the formulation" to view the formulation of the drug. | | |
| **Pre-condition:** | • The user must log into the system. | | |
| **Post-condition:** | • N/A | | |
| **Normal Flow:** | 1. The user opens the viewing drug formulation page.<br>2. The system shows a list of a drug formulation name.<br>3. The user selects the name of drug formulation that they want to see a detail.<br>4. The system shows a detail of the history that the user selected. | | |
| **Alternative Flow:** | • In step 3 of the normal flow, if the user uses search bar for searching the formulation by name instead of selecting the formulation in a list.<br>1. The user inputs the name into the search bar.<br>2. The user selects "submit" for searching the formulation by name.<br>3. The system shows the list of formulation. | | |
| **Exception:** | • In all of step of the normal flow, if the system disconnects from an internet.<br>1. The system shows the error message about internet disconnection. | | |
| **Include:** | URS-24 | | |

### URS 23: System requirement specification (SRS)

| No | System requirement specification (SRS) |
|---|---|
| SRS-196 | The system shows the list of drug formulation. |
| SRS-197 | The system provides the search bar for searching the drug formulation. The search bar uses the name of formulation to searching. |
| SRS-203 | The system shows the detail of the formulation. The substance the drug name, substance type, substance role, Substance Quantity, Substance Intensity. |
| SRS-12 | The system shall display the error message "The system is disconnect from the internet". |

## Use case9: Login to the system.

### URS-24: The user log in to the system.

Description

| | | | |
|---|---|---|---|
| **User Requirement Specification ID:** | URS-24 | | |
| **User Requirement Specification Name:** | The user log in to the system. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 1, 2014 | **Last Revision Date :** | April 1, 2014 |
| **Actor:** | General Pharmacists, Expert Pharmacists, Administrator | | |
| **Description:** | URS-24 is used, when the user wants to use the OEGP. | | |
| **Trigger:** | The user selects “login” to log in to the system. | | |
| **Pre-condition:** | • The user has been register as a member. | | |
| **Post-condition:** | • The system saves a member history in a system. | | |
| **Input data** | **Input Name** | **Example** | **Description** |
| | Email | “member01@gmail.com” | Username of the user should have length 4-15 characters |
| | Password | “password01” | Password of the user should have length 4-15 characters |
| **Normal Flow:** | 1. The user opens login page.<br>2. The user inputs email and password for login into a system.<br>3. The user selects a login symbol for log in to the system<br>4. The system shows main page of the program. | | |
| **Alternative Flow:** | N/A | | |
| **Exception:** | • In step 3 of the normal flow, if the user input the email or password wrong.<br>1. The system shows the error message about the email or password is wrong.<br>2. The user go back to do step 2 of the normal flow again.<br><br>• In all of step of the normal flow, if the system disconnects from an internet<br>1. The system shows the error message about internet disconnection. | | |
| **Include:** | URS-01 | | |

URS 24: System requirement specification (SRS)

| No | System requirement specification (SRS) |
|---|---|
| SRS-204 | The system provides the Graphic user interface (GUI) which receive email and password for logging in to the system. |
| SRS-205 | The system retrieves the email and password. |
| SRS-206 | The system can verify the email and password. |
| SRS-207 | The system retrieves the user information from the username. |
| SRS-208 | The system stores the user information as the current user. |
| SRS-209 | The system shows the main page of the program. |
| SRS-210 | The system shall display the error message “The username or password is invalid” |
| SRS-12 | The system shall display the error message “The system is disconnect from the internet”. |

## Use case10: Logout from the system

### URS-25: The user logouts from the system.

Description

| | | | |
|---|---|---|---|
| **User Requirement Specification ID:** | URS-24 | | |
| **User Requirement Specification Name:** | The user logouts from the system. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 1, 2014 | **Last Revision Date :** | April 1, 2014 |
| **Actor:** | General Pharmacists, Expert Pharmacists, Administrator | | |
| **Description:** | URS-24 is used, when the user want to log out from the OEGP. | | |
| **Trigger:** | The user select “log out” to log out from the system. | | |
| **Pre-condition:** | N/A | | |
| **Post-condition:** | N/A | | |
| **Normal Flow:** | 1. The user selects the log out symbols.<br>2. The system shows log in page after the log out is successful. | | |
| **Alternative Flow:** | N/A | | |
| **Exception:** | • In all of step of the normal flow, if the system disconnects from an internet<br>1. The system shows the error message about internet disconnection. | | |
| **Include:** | URS-24 | | |

URS 25: System requirement specification (SRS)

| No | System requirement specification (SRS) |
|---|---|
| SRS-211 | The system provides the Graphic user interface (GUI) which show the log out symbols |
| SRS-212 | The system shall shows the successful member log out. |
| SRS-12 | The system shall display the error message “The system is disconnect from the internet”. |