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

Software Requirement Specification

By

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# Document History

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| --- | --- | --- | --- | --- | --- | --- |
| **Document Name** | **Version** | **Status** | **Date** | **Viewable** | **Reviewer** | **Responsible** |
| **Documents** | | | | | | |
| **Ontology-based Expert System for a Generic Drug Production of Pharmaceutical Dosage Forms –Software Requirement v.0.1.docx** | **0.1**   * Introduction * Use case diagram * User scenario * User Requirement Specification (URS) * System Requirement Specification (SRS) | Draft | April 1, 2014 | NS, PW, CD | NS, PW | NS, PW |
| **Ontology-based Expert System for a Generic Drug Production of Pharmaceutical Dosage Forms –Software Requirement v.0.2.docx** | **0.2**   * Use case diagram * User Requirement Specification (URS) * System Requirement Specification (SRS) | Draft | April 12, 2014 | NS, PW, CD | NS, PW | NS, PW |
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# Chapter 1 | Introduction

Software Requirement describes the requirement specification of Ontology-base expert system for generic drug production of pharmaceutical dosage form. The Software Requirement is composed of the User requirement Specification (URS), User requirement description, System Requirement Specification (SRS) and non- functional requirement. The purpose of this document are making the same understanding of the stakeholder and supporting the future development.

# Chapter 2 | User Scenario

The client want to use the Ontology-base expert system for generic drug production of pharmaceutical dosage form 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 excipient 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 database 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.

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

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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 6 feature in the Ontology base expert system for generic drug production of pharmaceutical dosage form. The feature can divide into the User Requirement Specification. The User Requirement Specification (URS) is illustrated in Table below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Feature Name** | **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 excipient | URS-09 | The user adds a new excipient into the database. | Expert Pharmacists, Administrator |
| URS-10 | The user updates an existing excipient into the database. |
| URS-11 | The user deletes an existing excipient into the database. |
| 6 | Manage the drug formulation | URS-12 | The user adds a new drug formulation case into the database. | Expert Pharmacists, Administrator |
| URS-13 | The user updates an existing drug formulation case in the database. |
| URS-14 | The user deletes an existing drug formulation case in the database. |
| 7 | Login to the system | URS-15 | The user logins to the system. | General Pharmacists, Expert Pharmacists, Administrator |
| 8 | Logout from the system | URS-16 | The user logouts from the system. | General Pharmacists, Expert Pharmacists, Administrator |

### 3.1.2 User Requirement Description

#### Feature 1: Manage the user account

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

###### Input and output

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No** | **Input Name** | **Description** | **Example** | **Remarks** | **Output** |
| 1 | Name | Name of the user should have length 1-40 characters | “Panupak Wichaidit” | The word should be the character. | The system show “Panupak Wichaidit” on the screen. |
| 2 | Username | Username of the user should have length 4-15 characters | “member01” | The word should be the character with number | The system show “member 01” on the screen. |
| 3 | Password | Password of the user should have length 4-15 characters | “password01” | The word should be the characters with the number. | The system show “password 01” on the screen. |
| 4 | Telephone Number | Telephone number of the user should have equal 10 digit. | “089999098” | The word should be the numeric number. | The system show “089999098” on the screen. |
| 5 | Email | Email should be the same as the email address that user used. | “newnok6@gmail.com” | The word should be the email format | The system show “newnok6@gmail.com” on the screen. |

###### Description

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-01 | | |
| **User Requirement Specification Name:** | The user register 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 want to use the Ontology base expert system for generic drug production of pharmaceutical dosage form at the first time. | | |
| **Trigger:** | The user select “Register” to create a general pharmacist account. | | |
| **Pre-condition:** | N/A | | |
| **Post-condition:** | * The system saves a user information into a database. * An administrator receives a member registration request from the user. | | |
| **Normal Flow:** | 1. The user open the registration page for create a new member account. 2. The user input username, password, name, telephone number and email for member registration. 3. The user select a submit symbol for sending the member registration to administrator. 4. The system validate the username, password, name, telephone number and email. 5. The system displays the sending registration to administrator successful page. | | |
| **Alternative Flow:** | * In step 3 of the normal flow, if the user select “cancel” instead of “submit”.  1. The system shows the login page of the program.  * In step 3 of the normal flow, if the user select “reset” instead of “submit”.  1. The system resets the user information for member registration such as username, password, name, telephone number and email. | | |
| **Exception:** | * In step 4 of the normal flow, if the user input a name more than 40 characters or in wrong format.  1. The system shows the error message about a user’s name is more than 40 characters or in wrong format. 2. The user go back to do a step 2 again.  * In step 4 of the normal flow, if the user input a telephone number not equal 10 digit.  1. The system shows the error message about a user’s telephone number is not equal 10 digit. 2. The user go back to do a step 2 of the normal flow again.  * In step 4 of the normal flow, if the user input a username more than 15 characters or less than 4 characters.  1. The system shows the error message about a username is more than 15 characters or less than 4 characters. 2. The user go back to do a step 2 of the normal flow again.  * In step 4 of the normal flow, if the user input a password less than 4 characters or more than 15 characters.  1. The system shows the error message about a password less than 4 characters or more than 15 characters. 2. The user go back to do a step 2 of the normal flow again  * In step 4 of the normal flow, if the user input an email in a wrong format  1. The system shows the error message about an email format is wrong. 2. The user go back to do a step 2 of the normal flow again      * 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:** | N/A | | |

##### URS-02: The user update their information.

###### Input and output

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No** | **Input Name** | **Description** | **Example** | **Remarks** | **Output** |
| 1 | Name | Name of the user should have length 1-40 characters | “Narangrit Sisuwan” | The word should be the character. | The system show the “Narangrit Sisuwan” on the screen. |
| 2 | Password | Password of the user should have length 4-15 characters | “password01” | The word should be the characters with the number. | The system show the “password01” on the screen. |
| 3 | Telephone Number | Telephone number of the user should have equal 10 digit. | “089999098” | The word should be the numeric number. | The system show the “089999098”number on the screen. |

###### Description

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-02 | | |
| **User Requirement Specification Name:** | The user update 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 want to update their information. | | |
| **Trigger:** | The user select “update” to update information of the user. | | |
| **Pre-condition:** | * The user must log in to the system. | | |
| **Post-condition:** | * The system saves the user information into a database. | | |
| **Normal Flow:** | 1. The user open updating information page. 2. The system shows the existing user information such as the password, name, and telephone number. 3. The user input a new password, name, telephone number for information updating. 4. The user select “confirm” to update the information. 5. The system validate the password, name and telephone number format. 6. The system save the information updating into the database. 7. The system shows updating information successfully page. | | |
| **Alternative Flow:** | * In step 3 of the normal flow, if user select “cancel” instead of “confirm”  1. The system shows the main page of the program. | | |
| **Exception:** | * In step 5 of the normal flow, if the user input a name more than 40 characters.  1. The system shows the error message about a user’s name is more than 40 characters. 2. The user go back to do a step 2 again.  * In step 5 of the normal flow, if the user input a telephone number not equal 10 digit.  1. The system shows the error message about a user’s telephone number is not equal 10 digit. 2. The user go back to do a step 2 of the normal flow again.  * In step 5 of the normal flow, if the user input a password less than 4 characters or more than 15 characters.  1. The system shows the error message about a password less than 4 characters or more than 15 characters. 2. The user go back to do a step 2 of the normal flow again  * 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-15 | | |

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

###### Input and output

N/A

###### 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 want to delete the existing user account from the database. | | |
| **Trigger:** | The user select “delete the existing user” for deleting the existing user from the database. | | |
| **Pre-condition:** | * The administrator must log in to the system. | | |
| **Post-condition:** | * The system deletes the existing user from the database. | | |
| **Normal Flow:** | 1. The user open deleting the existing member page. 2. The system shows the list of member’s username from the database. 3. The administrator select the member username from the list of member username. 4. The administrator select “delete” for deleting the existing member account from the database. 5. The system shows the alert message for checking the member account deleting. 6. The administrator selects “Yes” for confirming to delete the member account. 7. The system delete the member account from the database. 8. The system shows deleting the existing excipient successful page. | | |
| **Alternative Flow:** | * In step 3 of the normal flow, if the user use search bar for searching the member account by using the username instead of selecting the username from the list of member’s username.  1. The administrator input the member’s username in a search bar. 2. The administrator select “searching” for searching the existing member account in the database. 3. The system show the information of member. 4. The step of this use case is resume at a step 4 of the normal flow.  * In the step 3 of the normal flow, if the user select “cancel” instead of selecting “Yes”.  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-15 | | |

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

###### Input and output

* **Input:** The administrator select the member username from the list of member registration request.
* **Output:** The system approve member registration and send the approving message to the user.

###### Description

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-04 | | |
| **User Requirement Specification Name:** | The user approve 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 want to approve a member registration that request from a person who want to be the general pharmacist. | | |
| **Trigger:** | The administrator select “approve member registration” to approve a member registration | | |
| **Pre-condition:** | * The administrator must log in to the system. * The administrator must receive the request of member registration from the general pharmacists. | | |
| **Post-condition:** | * The system saves an information about approving member registration into the database. * The system sends the email to the person who want to be general pharmacist about member registration is successful. * The system sends the email to the person who want to be general pharmacist about member registration is not approve by an administrator. This post condition is used when the user select “cancel” in Alternative flow. | | |
| **Normal Flow:** | 1. The administrator open the approving member registration page. 2. The system show the list of the general pharmacist registration that request from the person who want to be the general pharmacist. 3. The administrator select the request that want to approve as the general pharmacist. 4. The administrator select “confirm” to approve the request of member registration. 5. The system shows approving member registration is successfully. | | |
| **Alternative Flow:** | * In step 3 of the normal flow, if user select “cancel” instead of “confirm”  1. The system cancels the request of member registration. 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  1. The system shows the error message about internet disconnection. | | |
| **Include:** | URS-15 | | |

##### URS-05: The administrator change an authorized person status.

###### Input and output

* **Input:** The administrator select the member username for change the authorized person status.
* **Output:** The system saves the changing of authorized person status into a database.

###### Description

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-05 | | |
| **User Requirement Specification Name:** | The user change 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 want to change an authorized person status from a general pharmacist to an expert pharmacist. | | |
| **Trigger:** | The administrator select “change authorized person” to change the status of the members | | |
| **Pre-condition:** | * The administrator must log in to the system. * The system must have at least one of general pharmacist in the database. | | |
| **Post-condition:** | * The system saves the changing of authorized person status into a database. * The system sends the email to a person who has been change authorized person status by administrator. | | |
| **Normal Flow:** | 1. The administrator open the changing authorized person status page. 2. The system show the list of member username from the database. 3. The administrator select the member username for the authorize status changing. 4. The system shows the member detail which consist of username, name and authorize status. 5. The administrator select “change authorized status”. 6. The system show alert message for checking the authorized status changing. 7. The administrator select “confirm” to confirm an authorize status changing. 8. The system shows the changing authorized person status is successfully. | | |
| **Alternative Flow:** | * In step 3 of the normal flow, if the user use search bar for searching the member by username instead of selecting the member in a list of member username.  1. The administrator inputs the member username into the search bar. 2. The administrator selects “submit” for searching the member by the username. 3. The system shows the member username. 4. The process of this use case is continue at step 5 of the normal flow. | | |
| **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-15 | | |

#### Feature 2: Calculate the drug reformulation by using the inference engine.

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

###### Input and output

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **No** | **Part** | **Name** | **Description** | **Example** | **Remarks** | **Output** |
| 1 | Active Pharmaceutical ingredient (API) | Name | Name of the drug should be the characters | “Paracetamol” | The word should be the character. | The system show the name on the screen. |
| Amount of strength | Amount of the strength should be the decimal value. | 500.00 | The value should be the decimal value. | The system show the amount of strength on the screen. |
| Solubility | Solubility of the drug | “Sparing soluble” | The word should be the character. | The system show the solubility on the screen. |
| Flow ability | Flow ability of the drug | “Poor” | The word should be the character. | The system show the flow ability on the screen. |
| Compatibility | Compatibility of the drug | “Good” | The word should be the character. | The system show the compatibility on the screen. |
| Temperature Stability | Temperature stability of the drug | “Stable” | The word should be the character. | The system show the Temperature Stability on the screen. |
| Moisture Stability | Moisture Stability of the drug | “Stable” | The word should be the character. | The system show the Moisture Stability on the screen. |
| 2 | DF properties | Total weight | The Total weight of the drug | 630.00 | The value should be the decimal value. | The system show the total weight on the screen. |
| Disintegration Time | Disintegration Time of the drug | 28 | The value should be the Integer value. | The system show the Disintegration Time on the screen. |
| Hardness | Hardness of the drug | 8.30 | The value should be the decimal value. | The system show Hardness on the screen. |
| Dissolution Profile | Dissolution Profile of the drug | 81.31 | The value should be the decimal value. | The system show the Dissolution Profile on the screen. |
| 3 | Excipients | Excipients’ name | The excipient that using for produce the generic drug. | “Microcrystalline cellulose” | The word should be the character. | The system show the Excipients’ name on the screen. |

###### 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 in to the system. | | |
| **Post-condition:** | * The system saves the user information into a database. | | |
| **Normal Flow:** | 1. The user opens the calculate drug reformulation page 2. The user inputs the Pharmaceutical value such as active Pharmaceutical ingredient (API), DF Properties and excipient. 3. The user select the evaluation symbol for calculate drug reformulation. 4. The system show the menu of inference engine. The menu is consist of rule base system, case base reasoning system and hybrid system. 5. The user select some of inference engine from the menu of inference engine for making calculation. 6. The system shows the result that include appropriate manufacturing and excipient. | | |
| **Alternative Flow:** | N/A | | |
| **Exception:** | * In step 2 of the normal flow, if the user input an Amount of strength at API part in a wrong format.  1. The system shows the error message about Amount of strength format is wrong. 2. The user go back to do the step 2 of the normal flow again.  * In step 2 of the normal flow, if the user input a Total weight at DF properties part in a wrong format.  1. The system shows the error message about Total weight format is wrong. 2. The user go back to do the step 2 of the normal flow again.  * In step 2 of the normal flow, if the user input a Disintegration Time at DF Properties in a wrong format.  1. The system shows the error message about Disintegration Time format is wrong. 2. The user go back to do the step 2 of the normal flow again.  * In step 2 of the normal flow, if user input a Hardness at DF Properties in a wrong format.  1. The system shows the error message about Hardness format is wrong. 2. The user go back to do the step 2 of the normal flow again.  * In step 2 of the normal flow, if user input Dissolution Profile at DF Properties in a wrong format.  1. The system shows the error message about Dissolution Profile format is wrong. 2. The user go back to the step 2 of the normal flow again.  * 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-15 | | |

#### Feature 3: View the drug reformulation history.

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

###### Input and output

* **Input:** The user selects the date of drug reformulation from the list of drug reformulation history date for viewing the history.
* **Output:** The system shows the reformulation history detail from the database.

###### Description

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-07 | | |
| **User Requirement Specification Name:** | The user view 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 want to view the history of a drug reformulation. | | |
| **Trigger:** | The user select “view the history” to view the history of a drug reformulation. | | |
| **Pre-condition:** | * The user must log in to the system. | | |
| **Post-condition:** | * N/A | | |
| **Normal Flow:** | 1. The user opens the history of a drug reformulation page. 2. The system shows a list of a drug reformulation history date. 3. The user selects the date of drug reformulation that they want to see a detail. 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 history by date instead of selecting the history in a list.  1. The user input the date into the search bar. 2. The user select “submit” for searching a history by date. 3. The system shows the list of history. | | |
| **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-15 | | |

#### Feature 4: Make the drug reformulation evaluation.

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

###### Input and output

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No** | **Input Name** | **Description** | **Example** | **Remarks** | **Output** |
| 1 | Dissolution Profile | Dissolution profile of the drug. | 81.31 | The value should be the decimal value. | The system show the dissolution profile on the screen. |
| 2 | Disintegration time | Disintegration time of the drug. The time unit is second | 21 | The value should be the integer value. | The system show the disintegration time on the screen. |
| 3 | Pharmaceutical equivalence | Pharmaceutical value for making equivalence | 3 | The word should be the numeric number. | The system show the telephone number on the screen. |

###### Description

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-08 | | |
| **User Requirement Specification Name:** | The user makes a drug reformulation evaluation. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 7, 2014 | **Last Revision Date :** | April 7, 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 select “Evaluate” for making drug evaluation. | | |
| **Pre-condition:** | * The user must log in to the system. | | |
| **Post-condition:** | * The system saves the drug formulation evaluation into the database. | | |
| **Normal Flow:** | 1. The user opens drug formulation evaluation page. 2. The system shows the list of drug reformulation history. 3. The user selects a drug formulation from the list of drug reformulation history. 4. The system shows a detail of the history that the user selected. 5. The user selects “evaluate” for inputting value of drug formulation evaluation. 6. The user inputs the Dissolution profile, Disintegration time and Pharmaceutical equivalence of generic drug that the user produced. 7. The user selects “confirm” for making drug formulation evaluation. 8. The system shows the drug formulation evaluation successful page. | | |
| **Alternative Flow:** | * In step 3 of the normal flow, if the user use a search bar for searching the history by date instead of selecting the history in a list.  1. The user input the date into the search bar. 2. The user select “submit” for searching the drug formulation by date. 3. The system shows the drug formulation. 4. The step of this use case is resume at step at step 3 of the normal flow.  * In step 3 of the normal flow, if the user use search bar for searching the history by drug name instead of selecting the history in a list.  1. The user input the drug name into the search bar. 2. The user select “submit” for searching the drug formulation by date. 3. The system shows the drug formulation. 4. The step of this use case is resume at step at step 3 of the normal flow.  * In step 6 of the normal flow, if the system gets “fail” result instead of getting “successful” result.  1. The system shows a new drug formulation to the user.  * In the step 5 of the normal flow, if the user select “cancel” instead of selecting “confirm”.  1. The system shows the administrator main page. | | |
| **Exception:** | * In step 4 of the normal flow, if the user input dissolution profile in the wrong format.  1. The system shows the error message about Dissolution profile format is wrong. 2. The user go back to do the step 4 of the normal flow again.  * In step 4 of the normal flow, if the user input a Disintegration time in a wrong format.  1. The system shows the error message about Disintegration time format is wrong. 2. The user go back to do the step 4 of the normal flow again.  * In step 4 of the normal flow, if the user input a Pharmaceutical equivalence in a wrong format.  1. The system shows the error message about Disintegration Time format is wrong. 2. The user go back to do the step 4 of the normal flow again.  * 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-15 | | |

#### Feature 5: Manage the drug excipient.

##### URS-09: The user add a new excipient into the database.

###### Input and output

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No** | **Input Name** | **Example** | | **Remarks** | **Output** |
| 1 | Excipient’s name | “Aplo” | | The word should be the character. | The system show the “Aplo” on the screen. |
| 2 | Water Solubility Property | “SlightlySoluble” | | The value should be the integer value. | The system show the “SlightlySoluble” on the screen. |
| 3 | Stability Property | Degradation Mechanism: | “Oxidation” | The word should be the character. | The system show the “PseudoFirstOrderKinetic”on the screen. |
| Kinetic Reaction: | “FirstOrderKinetics” | The word should be the character. |
| 4 | Dissolution Property | “Weak” | | The word should be the character. | The system show the “Weak”on the screen. |
| 5 | Partition Coefficient Property | “GoodAbsorbtion” | | The word should be the character. | The system show the “GoodAbsorbtion” on the screen. |
| 6 | Physical Form Property | “CrystallineMaterials” | | The word should be the character. | The system show the “CrystallineMaterials” on the screen. |
| 7 | Hygroscopicity Property | “Slightly hygroscopic” | | The word should be the character. | The system show the “Slightly hygroscopic” on the screen. |
| 8 | Particle Property | “MicronizedParticle” | | The word should be the character. | The system show the “MicronizedParticle” on the screen. |
| 9 | Alcohol Solubility Property | “FreelySoluble” | | The word should be the character. | The system show the “FreelySoluble” on the screen. |
| 10 | Flow ability Property | “ExcellentFlowability” | | The word should be the character. | The system show the “ExcellentFlowability” on the screen. |
| 11 | Powder Density Property | “TrueIdentity” | | The word should be the character. | The system show the “TrueIdentity” on the screen. |
| 12 | Salt Property | Pka: | “Very weak” | The word should be the character. | The system show the “Salt Property”on the screen. |
| Molecular Weight: | 2.45 | The value should be the float value. |
| 13 | Weight Property | 2.55 | | The value should be the float value. | The system show the 2.55 on the screen. |
| 14 | Iconicity | “good” | | The word should be the character. | The system show the value of Iconicity on the screen. |

###### Description

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-09 | | |
| **User Requirement Specification Name:** | The user add a new excipient into the database. | | |
| **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-09 is used, when the user want to add a new excipient to the database. | | |
| **Trigger:** | The user select “Add the new excipient” for adding the new excipient to the database. | | |
| **Pre-condition:** | * The user must log in to the system. | | |
| **Post-condition:** | * The system save the new excipient to the database. | | |
| **Normal Flow:** | 1. The user open adding the new excipient page. 2. The user input the excipient 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. 3. The user select “save” for adding the new excipient. 4. The system validate the input value. 5. The system save the excipient updating into the database 6. The system shows the new excipient adding 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 main page of the program. | | |
| **Exception:** | * In step 4 of the normal flow, if the user input the excipient name that same as other excipient name in the database.  1. The system shows the error message about the excipient 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 input 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 input Stability Property in a wrong format.  1. The system shows the error message about the other data 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 input 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 input 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 input 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 input 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 input 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 input 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 input 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 input 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 input Salt Property in a wrong format.  1. The system shows the error message about the Salt 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 input Weight Property in a wrong format.  1. The system shows the error message about the Weight 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 input Iconicity in a wrong format.  1. The system shows the error message about the Iconicity is wrong. 2. The user go back to do the step 2 of the normal flow again.  * 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-02 | | |

##### URS-10: The user update an existing excipient in the database.

###### Input and output

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No** | **Input Name** | **Example** | | **Remarks** | **Output** |
| 1 | Excipient’s name | “Aplo” | | The word should be the character. | The system show the “Aplo” on the screen. |
| 2 | Water Solubility Property | “SlightlySoluble” | | The value should be the integer value. | The system show the “SlightlySoluble” on the screen. |
| 3 | Stability Property | Degradation Mechanism: | “Oxidation” | The word should be the character. | The system show the “PseudoFirstOrderKinetic”on the screen. |
| Kinetic Reaction: | “FirstOrderKinetics” | The word should be the character. |
| 4 | Dissolution Property | “Weak” | | The word should be the character. | The system show the “Weak”on the screen. |
| 5 | Partition Coefficient Property | “GoodAbsorbtion” | | The word should be the character. | The system show the “GoodAbsorbtion” on the screen. |
| 6 | Physical Form Property | “CrystallineMaterials” | | The word should be the character. | The system show the “CrystallineMaterials” on the screen. |
| 7 | Hygroscopicity Property | “Slightly hygroscopic” | | The word should be the character. | The system show the “Slightly hygroscopic” on the screen. |
| 8 | Particle Property | “MicronizedParticle” | | The word should be the character. | The system show the “MicronizedParticle” on the screen. |
| 9 | Alcohol Solubility Property | “FreelySoluble” | | The word should be the character. | The system show the “FreelySoluble” on the screen. |
| 10 | Flow ability Property | “ExcellentFlowability” | | The word should be the character. | The system show the “ExcellentFlowability” on the screen. |
| 11 | Powder Density Property | “TrueIdentity” | | The word should be the character. | The system show the “TrueIdentity” on the screen. |
| 12 | Salt Property | Pka: | “Very weak” | The word should be the character. | The system show the “Salt Property”on the screen. |
| Molecular Weight: | 2.45 | The value should be the float value. |
| 13 | Weight Property | 2.55 | | The value should be the float value. | The system show the 2.55 on the screen. |
| 14 | Iconicity | “good” | | The word should be the character. | The system show the value of Iconicity on the screen. |

###### Description

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-10 | | |
| **User Requirement Specification Name:** | The user update an existing excipient in the database. | | |
| **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-10 is used, when the user want to update the existing excipient in the database. | | |
| **Trigger:** | The user select “Update the existing excipient” for updating the existing excipient in the database. | | |
| **Pre-condition:** | * The user must log in to the system. | | |
| **Post-condition:** | * The systems save the excipient updating to the database. | | |
| **Normal Flow:** | 1. The user open updating the existing excipient in the database. 2. The user select the excipient from a list. 3. The user The user input the excipient 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 select “confirm to update” for update the existing excipient in the database. 5. The system validate the input value. 6. The system save the excipient updating into the database. 7. The system shows the existing excipient updating successful page. | | |
| **Alternative Flow:** | * In step 2 of the normal flow, if the user use search bar for searching the existing excipient by the excipient name instead of selecting the existing excipient in a list.  1. The user input the excipient name in a search bar. 2. The user select “searching” for searching the existing drug formulation in the database. 3. The system shows the excipient. 4. The step of this use case is resume at a step 3 of the normal flow.  * In the step 4 of the normal flow, if the user select “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 input the excipient name that same as other excipient name in the database.  1. The system shows the error message about the excipient 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 input 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 input Stability Property in a wrong format.  1. The system shows the error message about the other data 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 input 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 input 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 input 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 input 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 input 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 input 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 input 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 input 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 input Salt Property in a wrong format.  1. The system shows the error message about the Salt 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 input Weight Property in a wrong format.  1. The system shows the error message about the Weight 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 input Iconicity in a wrong format.  1. The system shows the error message about the Iconicity is wrong. 2. The user go back to do the step 2 of the normal flow again.  * 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-02 | | |

##### URS-11: The user delete an existing excipient into the database.

###### Input and output

* **Input:** The administrator select the existing excipients from the list of the excipient’s name for deleting the excipient from the database.
* **Output:** The system delete the excipients from the database and show successful message.

###### Description

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-11 | | |
| **User Requirement Specification Name:** | The user delete an existing excipient into the database. | | |
| **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-11 is used, when the user want to delete the existing excipient from the database. | | |
| **Trigger:** | The user select “delete the existing excipient” for deleting the existing excipient from the database. | | |
| **Pre-condition:** | * The user must log in to the system. | | |
| **Post-condition:** | * The system deletes the excipient from the database. | | |
| **Normal Flow:** | 1. The user open deleting the existing excipient page. 2. The user select existing excipient from the list. 3. The user select “confirm to delete” for deleting the existing excipient from the database. 4. The system shows the alert message for checking the drug excipient deleting. 5. The administrator selects “Yes” for confirming to delete the member account. 6. The system shows deleting the existing excipient successful page. | | |
| **Alternative Flow:** | * In step 2 of the normal flow, if the user use search bar for searching the existing excipient by the excipient name instead of selecting the existing excipient in a list.  1. The user input the excipient name in a search bar. 2. The user select “searching” for searching the existing drug formulation in the database. 3. The system show the excipient. 4. The step of this use case is resume at a step 3 of the normal flow.  * In the step 3 of the normal flow, if the user select “cancel” instead of selecting “Yes”.  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-02 | | |

#### Feature 6: Manage the drug formulation.

##### URS-12: The user add a new drug formulation case into the database.

###### Input and output

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Input Name** | **Example** | **Remarks** | **Output** |
| 1 | Drug name | “Lexapro” | The word should be the character. | The system show “Lexapro” on the screen. |
| 2 | Excipient | talc, croscarmellose sodium, microcrystalline cellulose/colloidal, silicon dioxide and magnesium | The list of excipient should be the character. | The system show list of excipient on the screen. |
| 3 | Strengths equivalent | 5 | The value of a strength equivalent should be the integer number | The system show the telephone number on the screen. |

###### Description

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-12 | | |
| **User Requirement Specification Name:** | The user add a new drug formulation case into the database. | | |
| **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 want to add a new reformulation case into the database for using with case base reasoning system. | | |
| **Trigger:** | The user select “Add a new case” for adding a new case into the database. | | |
| **Pre-condition:** | * The user must log in to the system. | | |
| **Post-condition:** | * The system saves the new drug reformulation case into the database. | | |
| **Normal Flow:** | 1. The user open add new drug reformulation case page. 2. The user input drug name, excipient and Strengths equivalent. 3. The user select “save” for saving a new drug reformation case into the database. 4. The system save a new drug formulation to the database. 5. The system shows a new drug reformulation 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  1. The system shows the error message about internet disconnection.  * In step 2 of the normal flow, if the user input the drug excipient in a wrong format.  1. The system shows the error message about the excipient format is wrong. 2. The user go back to do the step 2 of the normal flow again.  * In step 2 of the normal flow, if the user input the Strengths equivalent in a wrong format.  1. The system shows the error message about the Strengths equivalent format is wrong. 2. The user go back to do the step 2 of the normal flow again.  * In step 2 of the normal flow, if the user input the drug name that same as with other drug name in the database.  1. The system shows the error message about the drug name is already used. 2. The user go back to do the step 2 of the normal flow again. | | |
| **Include:** | URS-02 | | |

##### URS-13: The user update an existing drug formulation case in the database.

###### Input and output

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Input Name** | **Example** | **Remarks** | **Output** |
| 1 | Drug name | “Lexapro” | The word should be the character. | The system show “Lexapro” on the screen. |
| 2 | Excipient | talc, croscarmellose sodium, microcrystalline cellulose/colloidal, silicon dioxide and magnesium | The list of excipient should be the character. | The system show list of excipient on the screen. |
| 3 | Strengths equivalent | 5 | The value of a strength equivalent should be the integer number | The system show the telephone number on the screen. |

###### Description

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-13 | | |
| **User Requirement Specification Name:** | The user update an existing drug formulation case in the database. | | |
| **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 update an existing drug reformulation case in the database. | | |
| **Trigger:** | The user select “update an existing drug reformulation case” to update an existing case in the database. | | |
| **Pre-condition:** | * The user must log in to the system. | | |
| **Post-condition:** | * The system saves the drug reformulation updating into the database. | | |
| **Normal Flow:** | 1. The user open the drug reformulation updating page. 2. The user select an existing drug reformulation from a list for updating. 3. The user input a new data for updating such as the drug name, excipient and strengths equivalent. 4. The user select “confirm to update” for update an existing drug reformulation. 5. The system shows the existing drug reformulation updating successful page. | | |
| **Alternative Flow:** | * In step 2 of the normal flow, if the user use search bar for searching the existing drug formulation by the drug’s name instead of selecting the existing drug formulation in a list.  1. The user input the drug name in a search bar. 2. The user select “searching” for searching the existing drug formulation in the database. 3. The system shows the drug formulation. 4. The step of this use case is resume at a step 3 of the normal flow.  * In the step 3 of the normal flow, if the user select “cancel” instead of selecting “confirm to update”.  1. The system shows the administrator main page. | | |
| **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.  * In step 3 of the normal flow, if the user input the drug excipient in a wrong format.  1. The system shows the error message about the excipient format is wrong. 2. The user go back to do the step 3 of the normal flow again.  * In step 3 of the normal flow, if the user input the strengths equivalent in a wrong format.  1. The system shows the error message about the strengths equivalent format is wrong. 2. The user go back to do the step 3 of the normal flow again.  * In step 3 of the normal flow, if the user input the drug name that same as with other drug name in the database.  1. The system shows the error message about the drug name is already used. 2. The user go back to do the step 3 of the normal flow again. | | |
| **Include:** | URS-02 | | |

##### URS-14: The user delete an existing drug formulation case in the database.

###### Input and output

* **Input:** The administrator select the existing drug formulation from the list of the drug formulation name for deleting the formulation from the database.
* **Output:** The system delete the formulation from the database and show successful message.

###### Description

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-14 | | |
| **User Requirement Specification Name:** | The user delete an existing drug formulation case in the database. | | |
| **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 want delete the existing drug formulation case from the database. | | |
| **Trigger:** | The user select “Delete the existing drug reformulation” to delete a drug reformulation case from the database. | | |
| **Pre-condition:** | * The user must log in to the system. | | |
| **Post-condition:** | * The system deletes the existing drug formulation from the database. | | |
| **Normal Flow:** | 1. The user open the existing drug formulation deleting page. 2. The user select the drug name from the list. 3. The user select “delete” for delete the existing formulation case from the database. 4. The system shows the alert message for checking the drug excipient deleting. 5. The administrator selects “Yes” for confirming to delete the member account. 6. The system shows the existing drug formulation deleting successful page. | | |
| **Alternative Flow:** | * In the step 3 of the normal flow, if the user select “cancel” instead of selecting “Yes”.  1. The system shows the administrator main page.  * In step 2 of the normal flow, if the user use search bar for searching the existing drug formulation by the drug’s name instead of selecting the existing drug formulation in a list.  1. The user input the drug name in a search bar. 2. The user select “searching” for searching the existing drug formulation in the database. 3. The system shows the drug formulation. 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  1. The system shows the error message about internet disconnection. | | |
| **Include:** | URS-02 | | |

#### Feature 7: Login to the system.

##### URS-15: The user log in to the system.

###### Input and output

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No** | **Input Name** | **Description** | **Example** | **Remarks** | **Output** |
| 1 | Username | Username of the user should have length 4-15 characters | “member01” | The word should be the character with number | The system show the username on the screen. |
| 2 | Password | Password of the user should have length 4-15 characters | “password01” | The word should be the characters with the number. | The system show the password on the screen. |

###### Description

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-15 | | |
| **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-15 is used, when the user want to use the Ontology base expert system for generic drug production of pharmaceutical dosage form. | | |
| **Trigger:** | The user select “login” to log in to the system. | | |
| **Pre-condition:** | * The user has been install the program into the tablet computer. * The user has been register as a member. | | |
| **Post-condition:** | * The system saves a member history in a database. | | |
| **Normal Flow:** | 1. The user open login page. 2. The user input username and password for login into a system. 3. The user select a login symbol for log in to the system 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 a username or password wrong.  1. The system shows the error message about the username or password is wrong. 2. The user go back to do step 2 of the normal flow again.  * 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-01 | | |

#### Feature 8: Logout from the system

##### URS-16: The user logouts from the system.

###### Input and output

* **Input:** The user selects the logout symbol for the system log out.
* **Output:** The user log out from the system.

###### Description

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-16 | | |
| **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-16 is used, when the user want to log out from the Ontology base expert system for generic drug production of pharmaceutical dosage form. | | |
| **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. 2. The system show 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  1. The system shows the error message about internet disconnection. | | |
| **Include:** | URS-15 | | |

### 3.1.3 System Requirement Specification (SRS)

From the normal flow, alternative flow and exception of the User Requirement Description, it can divide into System requirement specification (SRS).

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

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-01 | The system provides the Graphic user interface (GUI) which receive username, password, retype - password, name, telephone number and email for member registration. |
| SRS-02 | The system can check the name format. The name format should be character and not more than 40 character. |
| SRS-03 | The system can check the username format. The username must be 4-15 character. |
| SRS-04 | The system can check the password format. The password must be 4-15 character. |
| SRS-05 | The system can check the telephone number format. The telephone number must be numeric number and equal 10 digit. |
| SRS-06 | The system can check the email format. The email must be the email format. |
| SRS-07 | The system shall retrieve the existing member data from username. |
| SRS-08 | The system shall send the request of a member registration to an administrator. |
| SRS-09 | The system shall show the successful sending request member registration page. |
| SRS-10 | The system shall show the error message “The name must be characters” |
| SRS-11 | The system shall display the error message “The name must be less than 40 characters” |
| SRS-12 | The system shall display the error message “The username length should be 4-15”. |
| SRS-13 | The system shall display the error message “The password length should be 4-15”. |
| SRS-14 | The system shall display the error message “The email format is not correct”. |
| SRS-15 | The system shall display the error message “The telephone format is not correct”. |
| SRS-16 | The system shall display the error message “The telephone number is not equal 10 digit”. |
| SRS-17 | The system shall display the error message “The username is already existed” |
| SRS-18 | The system shall display the error message “The email is already existed” |
| SRS-19 | The system shall display the error message “The system is disconnect from the internet”. |
| SRS-20 | The system shall display the error message “The retype-password is not same as password”. |

#### URS-02: The user update their information.

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-21 | The system provides the Graphic user interface (GUI) which receive username, password, retype-password, name, telephone number and email for member information updating. |
| SRS-02 | The system can check the name format. The name format should be character and not more than 40 character. |
| SRS-04 | The system can check the password format. The password must be 4-15 character. |
| SRS-05 | The system can check the telephone number format. The telephone number must be numeric number and equal 10 digit. |
| SRS-07 | The system shall retrieve the existing member data from username. |
| SRS-22 | The system shall show the successful member information updating page. |
| SRS-10 | The system shall show the error message “The name must be characters” |
| SRS-11 | The system shall display the error message “The name must be less than 40 characters” |
| SRS-13 | The system shall display the error message “The password length should be 4-15”. |
| SRS-15 | The system shall display the error message “The telephone format is not correct”. |
| SRS-16 | The system shall display the error message “The telephone number is not equal 10 digit”. |
| SRS-19 | The system shall display the error message “The system is disconnect from the internet”. |

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

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-23 | The system provides the Graphic user interface (GUI) which consists the list member username. |
| SRS-24 | The system shows the detail of the member account such as member username, email and telephone number. |
| SRS-25 | The system shows the Confirm dialog box (YES/NO option).For making confirm when the administrator want to delete the member account. |
| SRS-26 | The system shall show the successful member account deleting. |
| SRS-27 | The system provides the search bar for searching the member account The search bar use the member’s username for searching. |

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

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-28 | The system provides the Graphic user interface (GUI) which consists the list member registration request. |
| SRS-29 | The system shows the detail of the member registration request. The member registration detail include the username of a sender, time and date. |
| SRS-30 | The system shall show the successful member registration approving page. |
| SRS-31 | The system provides the search bar for searching the member registration request. The search bar use the date for searching. |
| SRS-32 | The system provides the search bar for searching the member registration request. The search bar use the username of a sender for searching. |

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

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-33 | The system provides the Graphic user interface (GUI) which consists the list member in the database. |
| SRS-34 | The system shows the detail of the member information. The member information detail include the username of a member, name and authorize status. |
| SRS-35 | The system provides the Graphic user interface (GUI) which consist the method of authorized person status changing. |
| SRS-36 | The system shall show the successful member registration approving page. |
| SRS-37 | The system provides the search bar for searching the member in the database. The search bar use the date for searching. |
| SRS-38 | The system provides the search bar for searching the member in the database. The search bar use the username of a sender for searching. |

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

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-39 | The system provides the Graphic user interface (GUI) which receive active Pharmaceutical ingredient (API), DF Properties and excipient. |
| SRS-40 | The system can check the amount of strength format at Pharmaceutical ingredient (API).The amount of strength format must be a decimal value. |
| SRS-41 | The system can check the total weight at DF property. The total weight must be a decimal value. |
| SRS-42 | The system can check the disintegration time. The disintegration time must be an integer value. |
| SRS-43 | The system can check the hardness at DF property. The hardness must be a decimal value. |
| SRS-44 | The system can check the Dissolution Profile at DF property. The Dissolution Profile must be a decimal value. |
| SRS-45 | The system provides the inference engine page .the page is include case base reasoning system, rule base system and hybrid system. |
| SRS-46 | The system shows the result page that include manufacturing and appropriate excipient. |
| SRS-47 | The system shall display the error message “The amount of strength must be the decimal value”. |
| SRS-48 | The system shall display the error message “The total weight must be the decimal value”. |
| SRS-49 | The system shall display the error message “The disintegration time must be the integer value”. |
| SRS-50 | The system shall display the error message “The hardness must be the decimal value”. |
| SRS-51 | The system shall display the error message “The dissolution profile must be the decimal value”. |
| SRS-19 | The system shall display the error message “The system is disconnect from the internet”. |

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

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-52 | The system shows the list of drug formulation history. |
| SRS-53 | The system provides the search bar for searching the history. The search bar use the date of making drug reformulation for searching. |
| SRS-54 | The system shows the detail of the history. The history detail include the drug’s name, date, manufacturing and ingredient. |
| SRS-19 | The system shall display the error message “The system is disconnect from the internet”. |

#### URS-08: The user make a drug reformulation evaluation.

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-52 | The system shows the list of drug formulation history. |
| SRS-55 | The system provides the Graphic user interface (GUI) which receive Dissolution profile, Disintegration time and Pharmaceutical equivalence. |
| SRS-44 | The system can check the Dissolution Profile at DF property. The Dissolution Profile must be a decimal value. |
| SRS-53 | The system provides the search bar for searching the history. The search bar use the date of making drug reformulation for searching. |
| SRS-56 | The system shall show the successful member information updating page. |
| SRS-42 | The system can check the disintegration time. The disintegration time must be an integer value. |
| SRS-57 | The system can check the Pharmaceutical equivalence. The Pharmaceutical equivalence must be the decimal value. |
| SRS-49 | The system shall display the error message “The disintegration time must be the integer value”. |
| SRS-51 | The system shall display the error message “The dissolution profile must be the decimal value”. |
| SRS-58 | The system shall display the error message “The Pharmaceutical equivalence must be the decimal value”. |
| SRS-19 | The system shall display the error message “The system is disconnect from the internet”. |

#### URS-09: The user add a new excipient into the database.

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-59 | The system provides the Graphic user interface (GUI) which receive excipient name, quantity and other data. |
| SRS-60 | The system can check the excipient name format. The excipient name format should be the character. |
| SRS-61 | The system can check the Water Solubility Property format. The Water Solubility Property format should be the character. |
| SRS-62 | The system can check the Stability Property format. The Stability Property format should be the character. |
| SRS-63 | The system can check the Dissolution Property format. The Dissolution Property format should be the character. |
| SRS-64 | The system can check the Partition Coefficient Property format. The Partition Coefficient Property format should be the character. |
| SRS-65 | The system can check the Physical Form Property format. The Physical Form Property format should be the character. |
| SRS-66 | The system can check the Hygroscopicity Property format. The Hygroscopicity Property format should be the character. |
| SRS-67 | The system can check the Particle Property format. The Particle Property format should be the character. |
| SRS-68 | The system can check the Alcohol Solubility Property format. The Alcohol Solubility Property format should be the character. |
| SRS-69 | The system can check the Flow ability Property format. The Flow ability Property format should be the character. |
| SRS-70 | The system can check the Microscopic Property format. The Microscopic Property format should be the character. |
| SRS-71 | The system can check the Powder Density Property format. The Powder Density Property format should be the character. |
| SRS-72 | The system can check the Salt Property format. The Salt Property format should be the float value. |
| SRS-73 | The system can check the Weight Property format. The Weight Property format should be float value. |
| SRS-74 | The system shall show the successful add a new excipient page. |
| SRS-75 | The system shall display the error message “The excipient name should be the characters”. |
| SRS-76 | The system shall display the error message “The Water Solubility Property should be the characters”. |
| SRS-77 | The system shall display the error message “The Stability Property should be the characters”. |
| SRS-78 | The system shall display the error message “The Dissolution Property should be the characters”. |
| SRS-79 | The system shall display the error message “The Partition Coefficient should be the characters”. |
| SRS-80 | The system shall display the error message “The Physical Form Property should be the characters”. |
| SRS-81 | The system shall display the error message “The Hygroscopicity Property should be the characters”. |
| SRS-82 | The system shall display the error message “The Particle Property should be the characters”. |
| SRS-83 | The system shall display the error message “The Alcohol Solubility Property should be the characters”. |
| SRS-84 | The system shall display the error message “The Flow ability Property should be the characters”. |
| SRS-85 | The system shall display the error message “The Microscopic Property should be the characters”. |
| SRS-86 | The system shall display the error message “The Powder Density Property should be the characters”. |
| SRS-87 | The system shall display the error message “The Salt Property should be the float value”. |
| SRS-88 | The system shall display the error message “The Weight Property should be the float value”. |
| SRS-19 | The system shall display the error message “The system is disconnect from the internet”. |

#### URS-10: The user update an existing excipient into the database.

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-59 | The system provides the Graphic user interface (GUI) which receive excipient name, quantity and other data. |
| SRS-89 | The system shows the list of the existing excipient in the database. |
| SRS-90 | The system provides the search bar for searching the list of excipient. The search bar use the name of excipient for searching. |
| SRS-60 | The system can check the excipient name format. The excipient name format should be the character. |
| SRS-61 | The system can check the Water Solubility Property format. The Water Solubility Property format should be the character. |
| SRS-62 | The system can check the Stability Property format. The Stability Property format should be the character. |
| SRS-63 | The system can check the Dissolution Property format. The Dissolution Property format should be the character. |
| SRS-64 | The system can check the Partition Coefficient Property format. The Partition Coefficient Property format should be the character. |
| SRS-65 | The system can check the Physical Form Property format. The Physical Form Property format should be the character. |
| SRS-66 | The system can check the Hygroscopicity Property format. The Hygroscopicity Property format should be the character. |
| SRS-67 | The system can check the Particle Property format. The Particle Property format should be the character. |
| SRS-68 | The system can check the Alcohol Solubility Property format. The Alcohol Solubility Property format should be the character. |
| SRS-69 | The system can check the Flow ability Property format. The Flow ability Property format should be the character. |
| SRS-70 | The system can check the Microscopic Property format. The Microscopic Property format should be the character. |
| SRS-71 | The system can check the Powder Density Property format. The Powder Density Property format should be the character. |
| SRS-72 | The system can check the Salt Property format. The Salt Property format should be the float value. |
| SRS-73 | The system can check the Weight Property format. The Weight Property format should be float value. |
| SRS-91 | The system shall show the successful the existing excipient updating page. |
| SRS-75 | The system shall display the error message “The excipient name should be the characters”. |
| SRS-76 | The system shall display the error message “The Water Solubility Property should be the characters”. |
| SRS-77 | The system shall display the error message “The Stability Property should be the characters”. |
| SRS-78 | The system shall display the error message “The Dissolution Property should be the characters”. |
| SRS-79 | The system shall display the error message “The Partition Coefficient should be the characters”. |
| SRS-80 | The system shall display the error message “The Physical Form Property should be the characters”. |
| SRS-81 | The system shall display the error message “The Hygroscopicity Property should be the characters”. |
| SRS-82 | The system shall display the error message “The Particle Property should be the characters”. |
| SRS-83 | The system shall display the error message “The Alcohol Solubility Property should be the characters”. |
| SRS-84 | The system shall display the error message “The Flow ability Property should be the characters”. |
| SRS-85 | The system shall display the error message “The Microscopic Property should be the characters”. |
| SRS-86 | The system shall display the error message “The Powder Density Property should be the characters”. |
| SRS-87 | The system shall display the error message “The Salt Property should be the float value”. |
| SRS-88 | The system shall display the error message “The Weight Property should be the float value”. |
| SRS-19 | The system shall display the error message “The system is disconnect from the internet”. |

#### URS-11: The user delete an existing excipient into the database.

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-89 | The system shows the list of the existing excipient in the database. |
| SRS-90 | The system provides the search bar for searching the list of excipient. The search bar use the name of excipient for searching. |
| SRS-92 | The system shows the Confirm dialog box (YES/NO option).For making confirm when the user want to delete an existing excipient. |
| SRS-93 | The system shall show the successful delete the existing excipient page. |
| SRS-19 | The system shall display the error message “The system is disconnect from the internet”. |

#### URS-12: The user add a new drug formulation case into the database.

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-94 | The system provides the Graphic user interface (GUI) which receive the drug name, ingredient and manufacturing. |
| SRS-95 | The system can check the drug name format. The drug name format should be the character. |
| SRS-96 | The system can check the excipient format. The excipient format should be the characters. |
| SRS-97 | The system can check the Strengths equivalent format. The Strengths equivalent format should be the integer value. |
| SRS-98 | The system shall show the successful add a new drug formulation page. |
| SRS-99 | The system shall display the error message “The drug name is not the characters”. |
| SRS-100 | The system shall display the error message “The excipient is not the characters”. |
| SRS-101 | The system shall display the error message “The Strengths equivalent is not the integer value”. |
| SRS-19 | The system shall display the error message “The system is disconnect from the internet”. |

#### URS-13: The user update an existing drug formulation case in the database.

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-94 | The system provides the Graphic user interface (GUI) which receive the drug name, ingredient and manufacturing. |
| SRS-102 | The system shows the list of drug formulation. |
| SRS-103 | The system provides the search bar for searching the list of drug formulation. The search bar use the name of drug for searching. |
| SRS-95 | The system can check the drug name format. The drug name format should be the character. |
| SRS-96 | The system can check the excipient format. The excipient format should be the characters. |
| SRS-97 | The system can check the Strengths equivalent format. The Strengths equivalent format should be the integer value. |
| SRS-104 | The system shall show the successful update existing drug formulation case page. |
| SRS-98 | The system shall display the error message “The drug name is not the characters”. |
| SRS-99 | The system shall display the error message “The drug name is already existed”. |
| SRS-100 | The system shall display the error message “The excipient is not the characters”. |
| SRS-101 | The system shall display the error message “The Strengths equivalent is not the integer value”. |
| SRS-19 | The system shall display the error message “The system is disconnect from the internet”. |

#### URS-14: The user delete an existing drug formulation case in the database.

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-102 | The system shows the list of drug formulation. |
| SRS-103 | The system provides the search bar for searching the list of drug formulation. The search bar use the name of drug for searching. |
| SRS-105 | The system shows the Confirm dialog box (YES/NO option).For making confirm when the administrator want to delete the existing drug formulation. |
| SRS-106 | The system shall show the successful delete existing drug formulation case page. |
| SRS-19 | The system shall display the error message “The system is disconnect from the internet”. |

#### URS-15: The user log in to the system.

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-107 | The system provide the Graphic user interface (GUI) which receive username, password for logging in to the system. |
| SRS-108 | The system retrieves the username and password. |
| SRS-109 | The system can verify the username and password. |
| SRS-110 | The system retrieves the user information from the username. |
| SRS-111 | The system stores the user information as the current user. |
| SRS-112 | The system shows the main page of the program. |
| SRS-113 | The system shall display the error message “The username or password is invalid” |
| SRS-19 | The system shall display the error message “The system is disconnect from the internet”. |

#### URS-16: The user logouts from the system.

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-114 | The system provide the Graphic user interface (GUI) which show the log out symbols |
| SRS-115 | The system shall show the successful member log out. |
| SRS-19 | The system shall display the error message “The system is disconnect from the internet”. |