Software Requirement

Document History

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| **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 |
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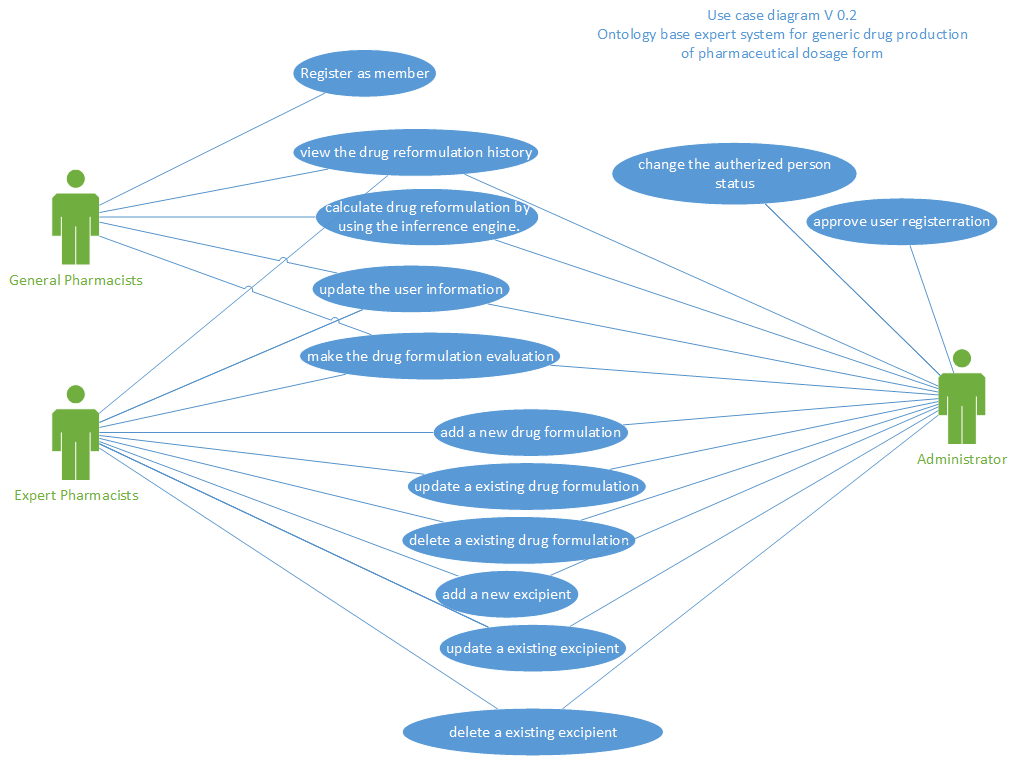
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# Chapter 1 | Introduction

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 users 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.

# 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 14 User Requirement Specification (URS) in the Ontology base expert system for generic drug production of pharmaceutical dosage form. The User Requirement Specification (URS) is illustrated in Table 1.

|  |  |  |
| --- | --- | --- |
| **No** | **User Requirement Specification (URS)** | **Actor** |
| URS-01 | The users register as a member. | General Pharmacists |
| URS-02 | The users log in to the system. | General Pharmacists, Expert Pharmacists, Administrator |
| URS-03 | The users calculate a drug reformulation by using an inference engine. | General Pharmacists, Expert Pharmacists, Administrator |
| URS-04 | The users make a drug reformulation evaluation. | General Pharmacists, Expert Pharmacists, Administrator |
| URS-05 | The users update their information. | General Pharmacists, Expert Pharmacists, Administrator |
| URS-06 | The users view their drug reformulation history. | General Pharmacists, Expert Pharmacists, Administrator |
| URS-07 | The users add a new drug formulation case into the database. | Expert Pharmacists, Administrator |
| URS-08 | The users update an existing drug formulation case in the database. | Expert Pharmacists, Administrator |
| URS-09 | The users delete an existing drug formulation case in the database. | Expert Pharmacists, Administrator |
| URS-10 | The users add a new excipient into the database. | Expert Pharmacists, Administrator |
| URS-11 | The users update an existing excipient into the database. | Expert Pharmacists, Administrator |
| URS-12 | The users delete an existing excipient into the database. | Expert Pharmacists, Administrator |
| URS-13 | The users approve a general pharmacist registration. | Administrator |
| URS-13 | The users change an authorized person status. | Administrator |

Table 1: URS list of Ontology base expert system for generic drug production of pharmaceutical dosage form

### 3.1.2 User Requirement Description

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

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-01 | | |
| **User Requirement Specification Name:** | The users register as a member. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 1, 2014 | **Last Revision Date :** | April 1, 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:** | * The users has been install the program into the tablet computer. | | |
| **Post-condition:** | * The system saves a user information into a database. * An administrator receives a member registration requirement from the user. | | |
| **Normal Flow:** | 1. The users open the registration page for create a new member account. 2. The users input username, password, name, telephone number and email for member registration. 3. The users select a submit symbol for sending the member registration to administrator. 4. The system displays the sending registration to administrator successful page. | | |
| **Alternative Flow:** | * In step 3 of the normal flow, if the users select “cancel” instead of “submit”.  1. The system shows the login page of the program.  * In step 3 of the normal flow, if the users 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 3 of the normal flow, if the users 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 users go back to do a step 2 again.  * In step 3 of the normal flow, if the users 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 users go back to do a step 2 of the normal flow again.  * In step 3 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 users go back to do a step 2 of the normal flow again.  * In step 3 of the normal flow, if the users 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 users go back to do a step 2 of the normal flow again  * In step 3 of the normal flow, if the users input an email in a wrong format  1. The system shows the error message about an email format is wrong. 2. The users 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 users log in to the system.

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-02 | | |
| **User Requirement Specification Name:** | The users 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-02 is used, when the users want to use the Ontology base expert system for generic drug production of pharmaceutical dosage form. | | |
| **Trigger:** | The users select “login” to log in to the system. | | |
| **Pre-condition:** | * The users has been install the program into the tablet computer. * The users has been register as a member. | | |
| **Post-condition:** | * The system saves a member history in a database. | | |
| **Normal Flow:** | 1. The users open login page. 2. The users input username and password for login into a system. 3. The users 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 users input a username or password wrong.  1. The system shows the error message about the username or password is wrong. 2. The users 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 | | |

#### URS-03: The users calculate a drug reformulation by using an inference engine.

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-03 | | |
| **User Requirement Specification Name:** | The users calculate a drug reformulation by using a rule base 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-03 is used, when the users want to calculate a drug reformulation as a generic version by using an inference engine system. | | |
| **Trigger:** | The users select “Calculate” to calculate drug reformulation as a generic version. | | |
| **Pre-condition:** | * The users must install the program into the tablet computer. * The users must log in to the system. | | |
| **Post-condition:** | * The system saves the user information into a database. | | |
| **Normal Flow:** | 1. The users open the calculate drug reformulation page 2. The users input the Pharmaceutical value such as active Pharmaceutical ingredient (API), DF Properties and excipient. 3. The users select the evaluation symbol for calculate drug reformulation. 4. The users select a rule base symbol. 5. The system shows the result that include manufacturing and appropriate excipient. | | |
| **Alternative Flow:** | * In step 4 of the normal flow, if the users select “case base reasoning” instead of “rule base”.  1. The system uses the case base reasoning for calculating drug reformulation. 2. The system shows the result page same as step 5 of the normal flow.  * In step 4 of the normal flow, if the users select “hybrid system” instead of “rule base”.  1. The system uses the hybrid system for calculating drug reformulation. 2. The system shows the result page same as step 5 of the normal flow. | | |
| **Exception:** | * In step 2 of the normal flow, if the users 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 users go back to do the step 2 of the normal flow again.  * In step 2 of the normal flow, if the users 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 users go back to do the step 2 of the normal flow again.  * In step 2 of the normal flow, if the users 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 users go back to do the step 2 of the normal flow again.  * In step 2 of the normal flow, if users input a Hardness at DF Properties in a wrong format.  1. The system shows the error message about Hardness format is wrong. 2. The users go back to do the step 2 of the normal flow again.  * In step 2 of the normal flow, if users 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 users 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-02 | | |

#### URS-04: The users make a drug formulation evaluation

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-04 | | |
| **User Requirement Specification Name:** | The users make 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-04 is used, when the users want to evaluate the drug formulation in the system after they produce a real generic drug in a lap. | | |
| **Trigger:** | The users select “Evaluate” for making drug evaluation. | | |
| **Pre-condition:** | * The users must install the program into the tablet computer. * The users must log in to the system. | | |
| **Post-condition:** | * The system saves the drug formulation evaluation into the database. | | |
| **Normal Flow:** | 1. The users open drug formulation evaluation page. 2. The users select a drug formulation from the list. 3. The users select “evaluate” for inputting value of drug formulation evaluation. 4. The users input the Dissolution profile, Disintegration time and Pharmaceutical equivalence of generic drug that the user produced. 5. The users select “confirm” for making drug formulation evaluation. 6. The system shows the drug formulation evaluation successful page. | | |
| **Alternative Flow:** | * In step 2 of the normal flow, if the users use a search bar for searching the history by date instead of selecting the history in a list.  1. The users input the date into the search bar. 2. The users 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 2 of the normal flow, if the users use search bar for searching the history by drug name instead of selecting the history in a list.  1. The users input the drug name into the search bar. 2. The users 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 users select “cancel” instead of selecting “confirm”.  1. The system shows the administrator main page. | | |
| **Exception:** | * In step 4 of the normal flow, if the users input dissolution profile in the wrong format.  1. The system shows the error message about Dissolution profile format is wrong. 2. The users go back to do the step 4 of the normal flow again.  * In step 4 of the normal flow, if the users input a Disintegration time in a wrong format.  1. The system shows the error message about Disintegration time format is wrong. 2. The users go back to do the step 4 of the normal flow again.  * In step 4 of the normal flow, if the users input a Pharmaceutical equivalence in a wrong format.  1. The system shows the error message about Disintegration Time format is wrong. 2. The users 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-02 | | |

#### URS-05: The users update their information.

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-04 | | |
| **User Requirement Specification Name:** | The users update their information. | | |
| **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-04 is used, when the users want to update their information. | | |
| **Trigger:** | The users select “update” to update information of the user. | | |
| **Pre-condition:** | * The users must install the program into the tablet computer. * The users must log in to the system. | | |
| **Post-condition:** | * The system saves the user information into a database. | | |
| **Normal Flow:** | 1. The users open updating information page. 2. The users input a new username, password, name, telephone number and email for updating information. 3. The users select “confirm” to update the information. 4. The system shows updating information successfully page. | | |
| **Alternative Flow:** | * In step 3 of the normal flow, if users select “cancel” instead of “confirm”  1. The system shows the main page of the program. | | |
| **Exception:** | * In step 3 of the normal flow, if the users 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 users go back to do a step 2 again.  * In step 3 of the normal flow, if the users 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 users go back to do a step 2 of the normal flow again.  * In step 3 of the normal flow, if the users input a username more than 15 characters.  1. The system shows the error message about a username is more than 15 characters. 2. The users go back to do a step 2 of the normal flow again.  * In step 3 of the normal flow, if the users 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 users go back to do a step 2 of the normal flow again  * In step 3 of the normal flow, if the users input an email in a wrong format  1. The system shows the error message about an email format is wrong. 2. The users 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-02 | | |

#### URS-06: The users view their drug reformulation history.

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-05 | | |
| **User Requirement Specification Name:** | The users see 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-05 is used, when the users want to view the history of a drug reformulation. | | |
| **Trigger:** | The users select “view the history” to view the history of a drug reformulation. | | |
| **Pre-condition:** | * The users must install the program into the tablet computer. * The users must log in to the system. | | |
| **Post-condition:** | * N/A | | |
| **Normal Flow:** | 1. The users open the history of a drug reformulation page. 2. The system shows a list of a drug reformulation history. 3. The users select the history 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 users use search bar for searching the history by date instead of selecting the history in a list.  1. The users input the date into the search bar. 2. The users select “submit” for searching a history by date. 3. The system shows the list of history.  * In step 3 of the normal flow, if the users use search bar for searching the history by the name of drug instead of selecting the history in a list.  1. The users input the name of drug into the search bar. 2. The users select “submit” for searching a history by the name of drug. 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-02 | | |

#### URS-07: The users add a new drug formulation case into the database.

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-07 | | |
| **User Requirement Specification Name:** | The users 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-06 is used, when the users want to add a new reformulation case into the database for using with case base reasoning system. | | |
| **Trigger:** | The users select “Add a new case” for adding a new case into the database. | | |
| **Pre-condition:** | * The user must install the program into the tablet computer. * 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 users open add new drug reformulation case page. 2. The users input drug name, ingredient and manufacturing. 3. The users select “save” for saving a new drug reformation case into the database. 4. The system shows a new drug reformulation case successful page. | | |
| **Alternative Flow:** | In the step 3 of the normal flow, if the users 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 users input the drug ingredient in a wrong format.  1. The system shows the error message about the ingredient format is wrong. 2. The users go back to do the step 2 of the normal flow again.  * In step 2 of the normal flow, if the users input the drug manufacturing in a wrong format.  1. The system shows the error message about the manufacturing format is wrong. 2. The users go back to do the step 2 of the normal flow again.  * In step 2 of the normal flow, if the users 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 users go back to do the step 2 of the normal flow again. | | |
| **Include:** | URS-02 | | |

#### URS-08: The users update an existing drug formulation case in the database.

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-08 | | |
| **User Requirement Specification Name:** | The users 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-07 is used, when the users update an existing drug reformulation case in the database. | | |
| **Trigger:** | The users select “update an existing drug reformulation case” to update an existing case in the database. | | |
| **Pre-condition:** | * The users must install the program into the tablet computer. * The users must log in to the system. | | |
| **Post-condition:** | * The system saves the drug reformulation updating into the database. | | |
| **Normal Flow:** | 1. The users open the drug reformulation updating page. 2. The users select an existing drug reformulation from a list for updating. 3. The users input a new data for updating such as the drug name, ingredients and manufacturing 4. The users 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 users 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 users input the drug name in a search bar. 2. The users 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 users 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 users input the drug ingredient in a wrong format.  1. The system shows the error message about the ingredient format is wrong. 2. The users go back to do the step 3 of the normal flow again.  * In step 3 of the normal flow, if the users input the drug manufacturing in a wrong format.  1. The system shows the error message about the manufacturing format is wrong. 2. The users go back to do the step 3 of the normal flow again.  * In step 3 of the normal flow, if the users 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 users go back to do the step 3 of the normal flow again. | | |
| **Include:** | URS-02 | | |

#### URS-09: The users delete an existing drug formulation case in the database.

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-09 | | |
| **User Requirement Specification Name:** | The users 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-08 is used, when the users want delete the existing drug formulation case from the database. | | |
| **Trigger:** | The users select “Delete the existing drug reformulation” to delete a drug reformulation case from the database. | | |
| **Pre-condition:** | * The users must install the program into the tablet computer. * The users must log in to the system. | | |
| **Post-condition:** | * The system deletes the existing drug formulation from the database. | | |
| **Normal Flow:** | 1. The users open the existing drug formulation deleting page. 2. The users select the drug name from the list. 3. The users select “delete” for delete the existing formulation case from the database. 4. The system shows the existing drug formulation deleting successful page. | | |
| **Alternative Flow:** | * In the step 3 of the normal flow, if the users select “cancel” instead of selecting “delete”.  1. The system shows the administrator main page.  * In step 2 of the normal flow, if the users 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 users input the drug name in a search bar. 2. The users 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 | | |

#### URS-10: The users add a new excipient into the database.

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-10 | | |
| **User Requirement Specification Name:** | The users 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 users want to add a new excipient to the database. | | |
| **Trigger:** | The users select “Add the new excipient” for adding the new excipient to the database. | | |
| **Pre-condition:** | * The users must install the program into the tablet computer. * The users must log in to the system. | | |
| **Post-condition:** | * The system save the new excipient to the database. | | |
| **Normal Flow:** | 1. The users open adding the new excipient page. 2. The users input the excipient name, quantity and other data. 3. The users select “save” for adding the new excipient. 4. The system shows the new excipient adding successful page. | | |
| **Alternative Flow:** | * In the step 3 of the normal flow, if the users select “cancel” instead of selecting “save”.  1. The system shows the main page of the program. | | |
| **Exception:** | * In step 2 of the normal flow, if the users 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 users go back to do the step 2 of the normal flow again.  * In step 2 of the normal flow, if the users input the quantity in a wrong format.  1. The system shows the error message about the quantity format is wrong. 2. The users go back to do the step 2 of the normal flow again.  * In step 2 of the normal flow, if the users input other data in a wrong format.  1. The system shows the error message about the other data is wrong. 2. The users 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 users update an existing excipient in the database.

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-11 | | |
| **User Requirement Specification Name:** | The users 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-09 is used, when the users want to update the existing excipient in the database. | | |
| **Trigger:** | The users select “Update the existing excipient” for updating the existing excipient in the database. | | |
| **Pre-condition:** | * The users must install the program into the tablet computer. * The users must log in to the system. | | |
| **Post-condition:** | * The systems save the excipient updating to the database. | | |
| **Normal Flow:** | 1. The users open updating the existing excipient in the database. 2. The users select the excipient from a list. 3. The users input a new data such as the excipient name, quantity and other information. 4. The users select “confirm to update” for update the existing excipient in the database. 5. The system shows the existing excipient updating successful page. | | |
| **Alternative Flow:** | * In step 2 of the normal flow, if the users use search bar for searching the existing excipient by the excipient name instead of selecting the existing excipient in a list.  1. The users input the excipient name in a search bar. 2. The users 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 3 of the normal flow, if the users select “cancel” instead of selecting “save”.  1. The system shows the main page of the program. | | |
| **Exception:** | * In step 3 of the normal flow, if the users 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 users go back to do the step 2 of the normal flow again.  * In step 3 of the normal flow, if the users input the quantity in a wrong format.  1. The system shows the error message about the quantity format is wrong. 2. The users go back to do the step 2 of the normal flow again.  * In step 3 of the normal flow, if the users input other data in a wrong format.  1. The system shows the error message about the quantity format is wrong. 2. The users 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-12: The users delete an existing excipient into the database.

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-12 | | |
| **User Requirement Specification Name:** | The users 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 users want to delete the existing excipient from the database. | | |
| **Trigger:** | The users select “delete the existing excipient” for deleting the existing excipient from the database. | | |
| **Pre-condition:** | * The users must install the program into the tablet computer. * The users must log in to the system. | | |
| **Post-condition:** | * The system deletes the excipient from the database. | | |
| **Normal Flow:** | 1. The users open deleting the existing excipient page. 2. The users select existing excipient from the list. 3. The users select “confirm to delete” for deleting the existing excipient from the database. 4. The system shows deleting the existing excipient successful page. | | |
| **Alternative Flow:** | * In step 2 of the normal flow, if the users use search bar for searching the existing excipient by the excipient name instead of selecting the existing excipient in a list.  1. The users input the excipient name in a search bar. 2. The users 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 users select “cancel” instead of selecting “confirm to delete”.  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 | | |

#### URS-13: The users approve a general pharmacist registration.

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-13 | | |
| **User Requirement Specification Name:** | The users approve a general pharmacist registration. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 2, 2014 | **Last Revision Date :** | April 2, 2014 |
| **Actor:** | Administrator | | |
| **Description:** | URS-10 is used, when the users want to approve a member registration that request from a person who want to be the general pharmacist. | | |
| **Trigger:** | The users select “approve member registration” to approve a member registration | | |
| **Pre-condition:** | * The users must install the program into the tablet computer. * The users must log in to the system. * The users 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 users open the approving member registration page. 2. The users select the request that the user want to approve as general pharmacist. 3. The users select “confirm” to approve the request of member registration. 4. The system shows approving member registration is successfully. | | |
| **Alternative Flow:** | * In step 3 of the normal flow, if users 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-02 | | |

#### URS-14: The users change an authorized person status.

|  |  |  |  |
| --- | --- | --- | --- |
| **User Requirement Specification ID:** | URS-14 | | |
| **User Requirement Specification Name:** | The users change an authorized person status. | | |
| **Create By :** | Panupak Wichaidit | **Last update by :** | Panupak Wichaidit |
| **Date Created :** | April 2, 2014 | **Last Revision Date :** | April 2, 2014 |
| **Actor:** | Administrator | | |
| **Description:** | URS-11 is used, when the users want to change an authorized person status from a general pharmacist to an expert pharmacist. | | |
| **Trigger:** | The users select “change authorized person” to change the status of the members | | |
| **Pre-condition:** | * The users must install the program into the tablet computer. * The users 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 users open the changing authorized person status page. 2. The users select the member that the user want to change the authorize status. 3. The system shows the member detail which consist of username, name and authorize status. 4. The users select “confirm” to confirm an authorize status changing. 5. The system shows the changing authorized person status is successfully. | | |
| **Alternative Flow:** | * In step 2 of the normal flow, if the users use search bar for searching the member by username instead of selecting the member in a list.  1. The users input the username into the search bar. 2. The users select “submit” for searching the member by the username. 3. The system shows the username. 4. The process of this use case is continue at step 4 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 | | |

### 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 users 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 users log in to the system.

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-21 | The system provide the Graphic user interface (GUI) which receive username, password for logging in to the system. |
| SRS-22 | The system retrieves the username and password. |
| SRS-23 | The system can verify the username and password. |
| SRS-24 | The system retrieves the user information from the username. |
| SRS-25 | The system stores the user information as the current user. |
| SRS-26 | The system shows the main page of the program. |
| SRS-27 | 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-03: The users calculate a drug reformulation by using an inference engine.

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-28 | The system provides the Graphic user interface (GUI) which receive active Pharmaceutical ingredient (API), DF Properties and excipient. |
| SRS-29 | The system can check the amount of strength format at Pharmaceutical ingredient (API).The amount of strength format must be a decimal value. |
| SRS-30 | The system can check the total weight at DF property. The total weight must be a decimal value. |
| SRS-31 | The system can check the disintegration time. The disintegration time must be an integer value. |
| SRS-32 | The system can check the hardness at DF property. The hardness must be a decimal value. |
| SRS-33 | The system can check the Dissolution Profile at DF property. The Dissolution Profile must be a decimal value. |
| SRS-34 | The system provides the inference engine page .the page is include case base reasoning system, rule base system and hybrid system. |
| SRS-35 | The system shows the result page that include manufacturing and appropriate excipient. |
| SRS-36 | The system shall display the error message “The amount of strength must be the decimal value”. |
| SRS-37 | The system shall display the error message “The total weight must be the decimal value”. |
| SRS-38 | The system shall display the error message “The disintegration time must be the integer value”. |
| SRS-39 | The system shall display the error message “The hardness must be the decimal value”. |
| SRS-40 | 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-04: The users make a drug reformulation evaluation.

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-41 | The system shows the list of drug formulation in the history. |
| SRS-42 | The system provides the Graphic user interface (GUI) which receive Dissolution profile, Disintegration time and Pharmaceutical equivalence. |
| SRS-33 | The system can check the Dissolution Profile at DF property. The Dissolution Profile must be a decimal value. |
| SRS-43 | The system provides the search bar for searching the history. The search bar use the date for searching. |
| SRS-44 | The system provides the search bar for searching the history. The search bar use the name of drug for searching. |
| SRS-45 | The system shall show the successful member information updating page. |
| SRS-31 | The system can check the disintegration time. The disintegration time must be an integer value. |
| SRS-46 | The system can check the Pharmaceutical equivalence. The Pharmaceutical equivalence must be the decimal value. |
| SRS-38 | The system shall display the error message “The disintegration time must be the integer value”. |
| SRS-40 | The system shall display the error message “The dissolution profile must be the decimal value”. |
| SRS-47 | 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-05: The users update their information.

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-48 | 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-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-49 | 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-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-06: The users view their drug reformulation history.

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-41 | The system shows the list of drug formulation in the history. |
| SRS-43 | The system provides the search bar for searching the history. The search bar use the date for searching. |
| SRS-44 | The system provides the search bar for searching the history. The search bar use the name of drug for searching. |
| SRS-49 | 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-07: The users add a new drug formulation case into the database.

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-50 | The system provides the Graphic user interface (GUI) which receive the drug name, ingredient and manufacturing. |
| SRS-51 | The system can check the drug name format. The drug name format should be the character. |
| SRS-52 | The system can check the ingredient format. The ingredient format should be the characters. |
| SRS-53 | The system can check the manufacturing format. The manufacturing format should be the characters and numbers. |
| SRS-54 | The system shall show the successful add a new drug formulation page. |
| SRS-55 | The system shall display the error message “The drug name is not the characters”. |
| SRS-56 | The system shall display the error message “The drug name is already existed”. |
| SRS-57 | The system shall display the error message “The ingredient is not the characters”. |
| SRS-58 | The system shall display the error message “The manufacturing is not the characters and numbers”. |
| SRS-19 | The system shall display the error message “The system is disconnect from the internet”. |

#### URS-08: The users update an existing drug formulation case in the database.

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-50 | The system provides the Graphic user interface (GUI) which receive the drug name, ingredient and manufacturing. |
| SRS-59 | The system shows the list of drug formulation. |
| SRS-60 | The system provides the search bar for searching the list of drug formulation. The search bar use the name of drug for searching. |
| SRS-51 | The system can check the drug name format. The drug name format should be the character. |
| SRS-52 | The system can check the ingredient format. The ingredient format should be the characters. |
| SRS-53 | The system can check the manufacturing format. The manufacturing format should be the characters and numbers. |
| SRS-61 | The system shall show the successful update existing drug formulation case page. |
| SRS-55 | The system shall display the error message “The drug name is not the characters”. |
| SRS-56 | The system shall display the error message “The drug name is already existed”. |
| SRS-57 | The system shall display the error message “The ingredient is not the characters”. |
| SRS-58 | The system shall display the error message “The manufacturing is not the characters and numbers”. |
| SRS-19 | The system shall display the error message “The system is disconnect from the internet”. |

#### URS-09: The users delete an existing drug formulation case in the database.

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-59 | The system shows the list of drug formulation. |
| SRS-60 | The system provides the search bar for searching the list of drug formulation. The search bar use the name of drug for searching. |
| SRS-62 | 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-10: The users add a new excipient into the database.

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-63 | The system provides the Graphic user interface (GUI) which receive excipient name, quantity and other data. |
| SRS-64 | The system can check the excipient name format. The excipient name format should be the character. |
| SRS-65 | The system can check the quantity. The quantity format should be the decimal value. |
| SRS-66 | The system can check the other data format. |
| SRS-67 | The system shall show the successful add a new excipient page. |
| SRS-68 | The system shall display the error message “The excipient name should be the characters”. |
| SRS-69 | The system shall display the error message “The quantity should be the decimal value”. |
| SRS-70 | The system shall display the error message “The other data format is wrong”. |
| SRS-19 | The system shall display the error message “The system is disconnect from the internet”. |

#### URS-11: The users update an existing excipient into the database.

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-63 | The system provides the Graphic user interface (GUI) which receive excipient name, quantity and other data. |
| SRS-71 | The system shows the list of the existing excipient in the database. |
| SRS-72 | The system provides the search bar for searching the list of excipient. The search bar use the name of excipient for searching. |
| SRS-64 | The system can check the excipient name format. The excipient name format should be the character. |
| SRS-65 | The system can check the quantity. The quantity format should be the decimal value. |
| SRS-66 | The system can check the other data format. |
| SRS-67 | The system shall show the successful add a new excipient page. |
| SRS-68 | The system shall display the error message “The excipient name should be the characters”. |
| SRS-69 | The system shall display the error message “The quantity should be the decimal value”. |
| SRS-70 | The system shall display the error message “The other data format is wrong”. |
| SRS-19 | The system shall display the error message “The system is disconnect from the internet”. |

#### URS-12: The users delete an existing excipient into the database.

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-71 | The system shows the list of the existing excipient in the database. |
| SRS-72 | The system provides the search bar for searching the list of excipient. The search bar use the name of excipient for searching. |
| SRS-73 | 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-13: The users approve a general pharmacist registration.

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-74 | The system provides the Graphic user interface (GUI) which consists the list member registration request. |
| SRS-75 | The system shows the detail of the member registration request. The member registration detail include the username of a sender, time and date. |
| SRS-76 | The system shall show the successful member registration approving page. |
| SRS-77 | The system provides the search bar for searching the member registration request. The search bar use the date for searching. |
| SRS-78 | The system provides the search bar for searching the member registration request. The search bar use the username of a sender for searching. |

#### URS-14: The users change an authorized person status.

|  |  |
| --- | --- |
| **No** | **System requirement specification (SRS)** |
| SRS-79 | The system provides the Graphic user interface (GUI) which consists the list member in the database. |
| SRS-80 | The system shows the detail of the member information. The member information detail include the username of a member, name and authorize status. |
| SRS-81 | The system provides the Graphic user interface (GUI) which consist the method of authorized person status changing. |
| SRS-82 | The system shall show the successful member registration approving page. |
| SRS-83 | The system provides the search bar for searching the member in the database. The search bar use the date for searching. |
| SRS-84 | The system provides the search bar for searching the member in the database. The search bar use the username of a sender for searching. |

## 3.2 Non - Functional Requirement