

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

Test Record

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Chapter | 1 Introduction

1.1 Purpose

The purpose of test record for Ontology Base Expert System for Generic Drug Production of Pharmaceutical Dosage Form is for recording the actual result and pass/fail criteria of each test case that have designed in the test plan and executed.

This document will include Unit Testing Record which contains Test date, Person who responsibility of Testing Record and Testing Record Table.

Test Record is a document, which recording the actual result of each test case that have designed in the test plan.

1.2 Acronyms

OEGP	Ontology-based Expert System for a Generic Drug Production of Pharmaceutical Dosage Forms
PDPO	Pharmaceutical Dosage Form Production Ontology
URS	User Requirement Specification
SRS	System Requirement Specification
CD	Class diagram
CD-CI	Class diagram For Client Side
CD-SV	Class diagram For Server Side.
SQD	Sequence Diagram
SQD-CI	Sequence Diagram For Client Side
SQD-SV	Sequence Diagram For Server Side
UI	User interface
SDD	Software Design Document
UTC-CI	Unit Test Case For Client Side
UTC-SV	Unit Test Case For Server Side
UTR-CI	Unit Test Record For Client Side
UTR-SV	Unit Test Record For Server Side

1.3 Responsibility

Item	Responsibility
Record unit test of Server Part	Narongrit Saisuwan
Record unit test Client Part	Panupak Wichaidit

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Chapter | 2 Unit Test Record

2.1 Unit Test Record for Client Side (UTR-CI).

2.1.1 SubstanceCtrl Class.

2.1.1.1 Unit Test Record for Client Side 01 (UTR-CI-01)

addNewSubstance(substance : Substance): Substance

Case No.	Description	Input data	Expect Result	Actual Result	status
		Substance object	Substance object	Substance object	
1	Test add substance object which is correct the formal of substance object.	(null,"substanceName","watersolubility",{"stability1","stability2"},3.4,4.6,"solidstate","hygroscopicity","particlesize","alcoholSolubility2","flowability2",4,"saltfrom2",5.34,"iconicity2")	(not null,"substanceName2","watersolubility2",{"stability1","stability2"},3.4,4.6,"solidstate2","hygroscopicity2","particlesize2","alcoholSolubility2","flowability2",4,"saltfrom2",5.34,"iconicity2")	(not null,"substanceName","watersolubility1",{"stability","stability1"},3,4,"solidstate","hygroscopicity","particleSize","alcoholSolubility","flowability",4,"saltfrom",5,"iconicity")	N/A
2	Test add substance object which is correct the formal of substance object.	(null,"substanceName1","watersolubility1",{"stability3","stability4"},6.32,7.67,"solidstate1","hygroscopicity1","particleSize1","alcoholSolubility1","flowability1",4.34,"saltfrom1",5.90,"iconicity1")	(not null,"substanceName1","watersolubility1",{"stability3","stability4"},6.32,7.67,"solidstate1","hygroscopicity1","particleSize1","alcoholSolubility1","flowability1",4.34,"saltfrom1",5.90,"iconicity1")	(not null,"substanceName1","watersolubility1",{"stability3","stability4"},5,7,"solidstate1","hygroscopicity1","particleSize1","alcoholSolubility1","flowability1",5,"saltfrom1",8,"iconicity1")	N/A
3	Test add substance object	("3","substanceName2","watersolubility1",{"stability3","stability4"},6.32,7.67,"solidstate1","hygroscopicity1","particleSize1","alcoholSolubility1","flowability1",4.34,"saltfrom1",5.90,"iconicity1")	null	null	N/A

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	which is contained in the database already.	y2",{"stability1","stability2"},3.45,4.32,"solidstate2","hygroscopicity2","particle size2","alcoholsolubility2","flowability2",4.3,"saltfrom2",5.45,"iconicity2"}"			
4	Test add substance object which is contained in the database already.	("4","substance name3","watersolubility3",{"stability3","stability4"},6.56,7.32,"solidstate3","hygroscopicity3","particle size3","alcoholsolubility3","flowability3",4.56,"saltfrom3",5,"iconicity3"}"	null	null	N/A

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2.1.1.2 Unit Test Record for Client Side 02 (UTR-CI-02)

updateSubstance(substance : Substance): Substance

Case No.	Description	Input data	Expect Result	Actual Result	Status
		Substance object	Substance object	Substance object	
1	Test update substance object which is correct the formal of substance object and contained in the database.	("3","substancename","watersolubility",{ "stability1","stability2"},3.34,4.56, "solidstate","hygroscopicity","particlesize","alcohosolubility2", "flowability",4.67,"saltfrom",5.12,"iconicity"})	("3","substancename","watersolubility",{ "stability1","stability2"},3.34,4.56, "solidstate","hygroscopicity","particlesize","alcohosolubility2", "flowability",4.67,"saltfrom",5.12,"iconicity"})	("3","substancename2","watersolubility2",{ "stability1","stability2"},3,4, "solidstate2","hygroscopicity2","particlesize2","alcohosolubility2", "flowability2",4,"saltfrom2",5,"iconicity2"})	N/A
2	Test update substance object which is correct the formal of substance object and contained in the database.	("4","substancename1","watersolubility3",{ "stability3","stability4"},5.32,7.56, "solidstate3","hygroscopicity3","particlesize3","alcohosolubility3", "flowability3",5.89,"saltfrom1",8.32,"iconicity3"})	("4","substancename1","watersolubility3",{ "stability3","stability4"},5.32,7.56, "solidstate3","hygroscopicity3","particlesize3","alcohosolubility3", "flowability3",5.89,"saltfrom1",8.32,"iconicity3"})	("4","substancename3","watersolubility3",{ "stability3","stability4"},5,7, "solidstate3","hygroscopicity3","particlesize3","alcohosolubility3", "flowability3",5,"saltfrom1",8,"iconicity3"})	N/A
3	Test update substance object which is not contained in the database.	("1","substancename4","watersolubility4",{ "stability1","stability2"},3,4, "solidstate4","hygroscopicity4","particlesize4","alcohosolubility4", "flowability4",4,"saltfrom4",5,"iconicity4"})	null	null	N/A
4	Test update substance object which is not contained in the database.	("2","substancename5","watersolubility5",{ "stability1","stability2"},3,4, "solidstate5","hygroscopicity5","particlesize5","alcohosolubility5", "flowability5",5,"saltfrom5",5,"iconicity5"})	null	null	N/A

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2.1.1.3 Unit Test Record for Client Side 03 (UTR-CI-03)

deleteSubstance(substance : Substance): Substance

Case No.	Description	Input data	Expect Result	Actual Result	Status
		Substance object	Substance object	Substance object	
1	Test delete substance object which is contained in database.	("3","substanceName","watersolubility",{ "stability1","stability2"},3.43,4.67,"solidstate","hygroscopicity","particlesize","alcoholubility","flowability",4.78,"saltfrom",5.10,"iconicity")	("3","substanceName","watersolubility",{ "stability1","stability2"},3.43,4.67,"solidstate","hygroscopicity","particlesize","alcoholubility","flowability",4.78,"saltfrom",5.10,"iconicity")	(null,"substanceName","watersolubility",{ "stability1","stability2"},3,4,"solidstate","hygroscopicity","particlesize","alcoholubility","flowability",4,"saltfrom",5,"iconicity")	N/A
2	Test delete substance object which is contained in database.	("4","substanceName1","watersolubility1",{ "stability3","stability4"},5.55,7.54,"solidstate1","hygroscopicity1","particlesize1","alcoholubility1","flowability1",5.90,"saltfrom1",8.45,"iconicity1")	("4","substanceName1","watersolubility1",{ "stability3","stability4"},5.55,7.54,"solidstate1","hygroscopicity1","particlesize1","alcoholubility1","flowability1",5.90,"saltfrom1",8.45,"iconicity1")	(null,"substanceName1","watersolubility1",{ "stability3","stability4"},5,7,"solidstate1","hygroscopicity1","particlesize1","alcoholubility1","flowability1",5,"saltfrom1",8,"iconicity1")	N/A
3	Test delete substance object which is not contained in database.	("1","substanceName2","watersolubility2",{ "stability1","stability2"},3.45,4.45,"solidstate2","hygroscopicity2","particlesize2","alcoholubility2","flowability2",4.78,"saltfrom2",5.86,"iconicity2")	null	null	N/A
4	Test delete substance object which is not contained.	("2","substanceName3","watersolubility3",{ "stability1","stability2"},3.34,4.56,"solidstate3","hygroscopicity3",	null	null	N/A

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		"particlesize3","alcohosolubility3","flowability3",4.56,"saltfrom2",5.56,"iconicity3")			
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2.1.1.4 Unit Test Record for Client Side 04 (UTR-CI-04)

getSubstanceList : Substance[]

case	Description	Expect result	Actual result	Status
		List of substance object	List of substance object	
1	Test get all substance list	{ substance1,substance2}	{ substance1,substance2}	N/A

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2.1.2 ExcipientCtrl Class.

2.1.2.1 Unit Test Record for Client Side 05 (UTR-CI-05)

addNewExcipient(excipient : Excipient): Excipient

Case No.	Description	Input data	Expect Result	Actual Result	Status
		Excipient object	Excipient object	Excipient object	
1	Test excipient which is correct the formal excipient object.	(null,substance1,{substanceFunction1, substanceFunction1} , 1.45)	(not null, substance1 , { substanceFunction1, substanceFunction3} , 1.45)	(not null, substance1 , { substanceFunction1, substanceFunction3} , 1)	N/A
2	Test add excipient which is correct the formal of excipient object.	(null, substance2 , { substanceFunction2, substanceFunction4} , 2.04)	(not null, substance4 , { substanceFunction2, substanceFunction4} , 2.04)	(not null, substance4 , { substanceFunction2, substanceFunction4} , 2)	N/A
3	Test add excipient object which is contained in the database already.	("3", substance3 , { substanceFunction1, substanceFunction2} , 3.56)	null	null	N/A
4	Test add excipient object which is contained in the database already.	("4", substance4, { substanceFunction3, substanceFunction4} , 4.06)	null	null	N/A

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2.1.2.2 Unit Test Record for Client Side 06 (UTR-CI-06)

updateExcipient(excipient : Excipient) : Excipient

Case No.	Description	Input data	Expect Result	Expect Result	Status
		Excipient object	Excipient object	Excipient object	
1	Test update excipient which is correct the formal of object excipient and contained in the database.	("3" , substance1 , { substanceFunction1, substanceFunction2} , 5.3)	("3" , substance1 , { substanceFunction1, substanceFunction2} , 5.3)	("3" , substance1 , { substanceFunction1, substanceFunction2} , 5)	N/A
2	Test update excipient which is correct the formal of excipient object and contained in the database.	("4" , substance2, { substanceFunction3, substanceFunction4} , 7.6)	("4" , substance2, { substanceFunction3, substanceFunction4} , 7.6)	("4" , substance2, { substanceFunction3, substanceFunction4} , 7)	N/A
3	Test update excipient which is not contained in the database.	("1" , substance1 , { substanceFunction1, substanceFunction2} , 4)	null	null	N/A
4	Test update excipient which is not contained in the database.	("2" , substance2 , { substanceFunction3, substanceFunction4} , 9)	null	null	N/A

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2.1.2.3 Unit Test Record for Client Side 07 (UTR-CI-07)

deleteExcipient (excipient : Excipient):Excipient

Case No.	Description	Input data	Expect Result	Actual Result	Status
		Excipient object	Excipient object	Excipient object	
1	Test delete excipient which is contained in database.	("3" , substance3 , {substanceFunction1, substanceFunction2} , 3.4)	(null, substance3 , {substanceFunction1, substanceFunction2} , 3.4)	(null, substance3 , {substanceFunction1, substanceFunction2} , 3)	N/A
2	Test delete excipient which is contained in database.	("4" , substance4, {substanceFunction3, substanceFunction4} , 4.9)	(null , substance4, {substanceFunction3, substanceFunction4} , 4.9)	(null , substance4, {substanceFunction3, substanceFunction4} , 4)	N/A
3	Test delete excipient which is not contained in database.	("1" , substance1, {substanceFunction3, substanceFunction4} , 5.5)	null	null	N/A
4	Test delete excipient which is not contained in database.	("2" , substance2, {substanceFunction1, substanceFunction2} , 7.9)	null	null	N/A

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2.1.2.4 Unit Test Record for Client Side 08 (UTR-CI-08)

getAllExcipient () : Excipient []

case	Description	Expect result	Actual result	Status
		excipient object List	excipient object List	
1	Test get all excipient list.	{ excipient1,excipient2}	{ excipient1,excipient2}	N/A

2.1.2.5 Unit Test Record for Client Side 09 (UTR-CI-09)

getSubstanceList() : Substance []

case	Description	Expect result	Expect result	Status
		substance object List	substance object List	
1	Test get all substance list.	{ substance1, substance2, substance3, substance4}	{ substance1, substance2, substance3, substance4}	N/A

2.1.2.6 Unit Test Record for Client Side 10 (UTR-CI-10)

getCurrentSubstanceFnList() : SubstanceFunction []

case	Description	Expect result	Actual result	Status
		substanceFunction object List	substanceFunction object List	
1	Test get all substanceFunction list.	{ substanceFunction1, substanceFunction2, substanceFunction3, substanceFunction4}	{ substanceFunction1, substanceFunction2, substanceFunction3, substanceFunction4}	N/A

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2.1.3 FormulationCtrl Class.

2.1.3.1 Unit Test Record for Client Side 11 (UTR-CI-11)

addFormulation(formulation : Formulation) : Formulation

Case No.	Description	Input data	Expect Result	Expect Result	Status
		Formulation object	Formulation object	Formulation object	
1	Test add formulation object which is correct the formal of formulation object.	(null , "name1", "type1", 1.9, {excipient1,excipient2})	(not null , "name1", "type1", 1.9, {excipient1,excipient2})	(not null , "name1", "type1", 1, {excipient1,excipient2})	N/A
2	Test add formulation which is correct the formal of formulation object.	(null , "name4", "type4", 4.3, {excipient3,excipient4})	(not null, "name4", "type4", 4.3, {excipient3,excipient4})	(not null, "name4", "type4", 4, {excipient3,excipient4})	N/A
3	Test add formulation object which is contained in the database already.	("3" , "name3", "type3", 3.5, {excipient1,excipient2})	null	null	N/A
4	Test add formulation object which is contained in the database already.	("4" , "name4", "type4", 4.7, {excipient3,excipient4})	null	null	N/A

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2.1.3.2 Unit Test Record for Client Side 12 (UTR-CI-12)

updateFormulation(formulation : Formulation) : Formulation

Case No.	Description	Input data	Expect Result	Expect Result	Status
		formulation object	formulation object	formulation object	
1	Test update formulation object which is correct the formal of formulation object.	("3" , "name1", "type1", 1.4, {excipient3,excipient4})	("3" , "name1", "type1", 1.4, {excipient3,excipient4})	("3" , "name1", "type1", 1, {excipient3,excipient4})	N/A
2	Test update formulation object which is correct the formal of formulation object.	("4" , "name2", "type2", 2.2, {excipient1,excipient2})	("4" , "name2", "type2", 2.2, {excipient1,excipient2})	("4" , "name2", "type2", 2, {excipient1,excipient2})	N/A
3	Test update formulation object which is not contained in the database.	("1" , "name1", "type1", 1.5, {excipient1,excipient2})	null	null	N/A
4	Test update formulation object which is not contained in the database.	("2" , "name2", "type2", 2.7, {excipient3,excipient4})	null	null	N/A

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2.1.3.3 Unit Test Record for Client Side 13 (UTR-CI-13)

deleteFormulation(formulation : Formulation) : Formulation

Case No.	Description	Input data	Expect Result	Actual Result	Status
		formulation object	formulation object	formulation object	
1	Test delete formulation object which is contained in database and correct format formulation object.	("3" , "name3" , "type3" , 3.5, {excipient1,excipient2})	("3" , "name3" , "type3" , 3.5, {excipient1,excipient2})	("3" , "name3" , "type3" , 3, {excipient1,excipient2})	N/A
2	Test delete formulation object which is contained in database and correct format formulation object.	("4" , "name4" , "type4" , 4.9, {excipient3,excipient4})	("4" , "name4" , "type4" , 4.9, {excipient3,excipient4})	("4" , "name4" , "type4" , 4, {excipient3,excipient4})	N/A
3	Test delete formulation object which is not contained in database.	("1" , "name1" , "type1" , 1.4, {excipient1,excipient1})	null	null	N/A
4	Test delete formulation object which is not contained in database.	("2" , "name2" , "type2" , 2.8, {excipient3,excipient4})	null	null	N/A

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2.1.3.4 Unit Test Record for Client Side 14 (UTR-CI-14)

geFormulationList() : Formulation []

case	Description	Expect result	Actual result	Status
		List of formulation object	List of formulation object	
1	Test get all formulation object list.	{formulation1,formulation2}	{formulation1,formulation2}	N/A

2.1.3.5 Unit Test Record for Client Side 15 (UTR-CI-15)

getExcipientList () : Excipient []

case	Description	Expect result	Actual result	Status
		excipient object List	List of excipient object	
1	Test get all excipient list.	{ excipient1,excipient2}	{formulation1,formulation2}	N/A

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2.1.4 FormulationCtrl Class.

2.1.4.1 Unit Test Record for Client Side 16 (UTR-CI-16)

getFormulationList() : Formulation []

case	Description	Expect result	Expect result	Actual result	Status
		List of formulation object	List of formulation object	List of formulation object	
1	Test get all formulation list	{ reformulation1, reformulationHistory2, reformulationHistory3, reformulationHistory2 }	{ reformulation1, reformulationHistory2, reformulationHistory3, reformulationHistory2 }	{ reformulation1, reformulationHistory2, reformulationHistory3, reformulationHistory2 }	N/A

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2.1.5 ReformulationHisCtrl Class.

2.1.5.1 Unit Test Record for Client Side 17 (UTR-CI-17)

updateReformulationHistory(reformulationHistory : ReformulationHistory) : ReformulationHistory

Case No.	Description	Input data	Expect Result	Status
		reformulationHistory object	reformulationHistory object	
1	Test update reformulationHistory object which is correct the formal of reformulationHistory object and contained in the database.	("3", {reformulatedProduction1, reformulatedProduction3},"4/11/209 ", user1)	("3", {reformulatedProduction1, reformulatedProduction3},"4/11/209 ", user1)	N/A
2	Test update reformulationHistory object which is correct the formal of reformulationHistory object and contained in the database.	("4", {reformulatedProduction2, reformulatedProduction4},"6/6/2013 ", user2)	("4", {reformulatedProduction2, reformulatedProduction4},"6/6/2013 ", user2)	N/A
3	Test update reformulationHistory object which is not contained in the database.	("1", {reformulatedProduction1, reformulatedProduction3},"4/11/209 ", user1)	null	N/A
4	Test update reformulationHistory object which is not contained in the database.	("2", {reformulatedProduction2, reformulatedProduction4},"6/6/2013 ", user2)	null	N/A

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2.1.5.2 Unit Test Record for Client Side 18 (UTR-CI-18)

deleteReformulationHistory(String id) : ReformulationHistory

Case No.	Description	Input data	Expect Result	Expect Result	Status
		Id	reformulationHistory object	reformulationHistory object	
1	Test delete reformulationHistory object which is contained in database and correct format reformulationHistory object.	"3"	("3", {reformulatedProduction1, reformulatedProduction2}, "5/10/2014 ", user1)	("3", {reformulatedProduction1, reformulatedProduction2}, "5/10/2014 ", user1)	N/A
2	Test delete reformulationHistory object which is contained in database and correct format reformulationHistory.	"4"	("4", {reformulatedProduction3, reformulatedProduction4}, "7/4/2008 ", user2)	("4", {reformulatedProduction3, reformulatedProduction4}, "7/4/2008 ", user2)	N/A
3	Test delete reformulationHistory object which is not contained in database or incorrect format reformulationHistory object.	"1"	null	null	N/A
4	Test delete reformulationHistory object which is not contained in database or incorrect format reformulationHistory object.	"2"	null	null	N/A

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2.2 Unit Test Record for Server Side (UTR-SV).

2.2.1 SubstanceServiceImpl Class.

2.2.1.1 Unit Test Record for Server Side 01 (UTR-SV-01)

add (substance: Substance): Substance

Case No.	Description	Input data	Expect Result	Actual Result	Status
		Substance object	Substance object	Substance object	
1	Test add substance object which is correct the formal of substance object.	(null,"substanceName","watersolubility",{"stability1","stability2"},3,4,"solidstate","hygroscopicity","particlesize","alcoholubility","flowability",4,"saltfrom",5,"iconicity")	(not null,"substanceName","watersolubility1",{"stability","stability1"},3,4,"solidstate","hygroscopicity","particle size","alcoholubility","flowability",4,"saltfrom",5,"iconicity")	(not null,"substanceName","watersolubility1",{"stability","stability1"},3,4,"solidstate","hygroscopicity","particlesize","alcoholubility","flowability",4,"saltfrom",5,"iconicity")	pass
2	Test add substance object which is correct the formal of substance object.	(null,"substanceName1","watersolubility1",{"stability3","stability4"},5,7,"solidstate1","hygroscopicity1","particle size1","alcoholubility1","flowability1",5,"saltfrom1",8,"iconicity1")	(not null,"substanceName1","watersolubility1",{"stability3","stability4"},5,7,"solidstate1","hygroscopicity1","particle size1","alcoholubility1","flowability1",5,"saltfrom1",8,"iconicity1")	(not null,"substanceName1","watersolubility1",{"stability3","stability4"},5,7,"solidstate1","hygroscopicity1","particle size1","alcoholubility1","flowability1",5,"saltfrom1",8,"iconicity1")	pass
3	Test add substance object which is contained in the	("3","substanceName2","watersolubility2",{"stability1","stability2"},3,4,"solidstate2","hygroscopicity2","particle size2","alcoholubility2",	null	null	pass

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	database already.	"flowability2",4,"saltfrom2",5,"iconicity2"}			
4	Test add substance object which is contained in the database already.	("4","substancename3","watersolubility3",{ "stability3","stability4"},6,7,"solidstate3","hygroscopicity3","particle size3","alcoholosolubility3","flowability3",4,"saltfrom3",5,"iconicity3"}	null	null	pass

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2.2.1.2 Unit Test Record for Server Side 02 (UTR-SV-02)

update(substance: Substance): Substance

Case No.	Description	Input data	Expect Result	Actual Result	Status
		Substance object	Substance object	Substance object	
1	Test update substance object which is correct the formal of substance object and contained in the database.	("3","substance2","watersolubility2",{ "stability1","stability2"},3,4,"solidstate2","hygroscopicity2","particlesize2","alcoholubility2","flowability2",4,"saltfrom2",5,"iconicity2")	("3","substance2","watersolubility2",{ "stability1","stability2"},3,4,"solidstate2","hygroscopicity2","particlesize2","alcoholubility2","flowability2",4,"saltfrom2",5,"iconicity2")	(not null,"substance","watersolubility1",{ "stability","stability1"},3,4,"solidstate","hygroscopicity","particlesize","alcoholubility","flowability",4,"saltfrom",5,"iconicity")	pass
2	Test update substance object which is correct the formal of substance object and contained in the database.	("4","substance3","watersolubility3",{ "stability3","stability4"},5,7,"solidstate3","hygroscopicity3","particlesize3","alcoholubility3","flowability3",5,"saltfrom1",8,"iconicity3")	("4","substance3","watersolubility3",{ "stability3","stability4"},5,7,"solidstate3","hygroscopicity3","particlesize3","alcoholubility3","flowability3",5,"saltfrom1",8,"iconicity3")	(not null,"substance1","watersolubility1",{ "stability3","stability4"},5,7,"solidstate1","hygroscopicity1","particlesize1","alcoholubility1","flowability1",5,"saltfrom1",8,"iconicity1")	pass
3	Test update substance object which is not contained in the database.	("substance4","watersolubility4",{ "stability1","stability2"},3,4,"solidstate4","hygroscopicity4","particlesize4","alcoholubility4","flowability4",4,"saltfrom4",5,"iconicity4")	null	null	pass
4	Test update substance object which is not contained in the database.	(null,"substance5","watersolubility5",{ "stability1","stability2"},3,4,"solidstate5","hygroscopicity5","particlesize5","alcoholubility5","flowability5",5,"saltfrom5",5,"iconicity5")	null	null	pass

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2.2.1.3 Unit Test Record for Server Side 03 (UTR-SV-03).

delete(substance : Substance): Substance

Case No.	Description	Input data	Expect Result	Actual Result	Status
		Substance object	Substance object	Substance object	
1	Test delete substance object which is contained in database.	("3","substance","watersolubility", {"stability1","stability2"},3,4,"solidstate","hygroscopicity", "particlesize","alcoholsolubility","flowability", 4,"saltfrom", 5,"iconicity")	(null,"substance","watersolubility", {"stability1","stability2"},3,4,"solidstate","hygroscopicity", "particlesize","alcoholsolubility","flowability",4,"saltfrom", 5,"iconicity")	(null,"substance","watersolubility", {"stability1","stability2"},3,4,"solidstate","hygroscopicity", "particlesize","alcoholsolubility","flowability",4,"saltfrom", 5,"iconicity")	pass
2	Test delete substance object which is contained in database.	("4","substance1","watersolubility1", {"stability3","stability4"},5,7,"solidstate1","hygroscopicity1", "particlesize1","alcoholsolubility1","flowability1",5,"saltfrom1", 8,"iconicity1")	(null,"substance1","watersolubility1", {"stability3","stability4"},5,7,"solidstate1","hygroscopicity1", "particlesize1","alcoholsolubility1","flowability1",5,"saltfrom1", 8,"iconicity1")	(null,"substance1","watersolubility1", {"stability3","stability4"},5,7,"solidstate1","hygroscopicity1", "particlesize1","alcoholsolubility1","flowability1",5,"saltfrom1", 8,"iconicity1")	pass
3	Test delete substance object which is not contained in database.	("1","substance2","watersolubility2", {"stability1","stability2"},3,4,"solidstate2","hygroscopicity2", "particlesize2","alcoholsolubility2","flowability2",4,"saltfrom2", 5,"iconicity2")	null	null	pass
4	Test delete substance object which is not contained.	("2","substance3","watersolubility3", {"stability1","stability2"},3,4,"solidstate3","hygroscopicity3", "particlesize3","alcoholsolubility3","flowability3",4,"saltfrom2", 5,"iconicity3")	null	null	Pass

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2.2.1.4 Unit Test Record for Server Side 04 (UTR-SV-04)

getAllSubstance : Substance[]

case	Description	Expect result	Actual Result	status
		List of substance object	List of substance object	pass
1	Test get all substance list	{ substance1,substance2}	{ substance1,substance2}	pass

2.2.1.5 Unit Test Record for Server Side 05 (UTR-SV-05)

getSubstanceById (id : String):Substance

Case No.	Description	Input data	Expect Result	Actual Result	Status
		substance id	Substance object	Substance object	
1	Test get substance object which is contained in database by substance id.	1	(1,"substance","watersolubility",{stability1,"stability2"},3,4,"solidstate","hygroscopicity","particlesize","alcohosolubility","flowability",4,"saltfrom",5,"iconicity")	(1,"substance","watersolubility",{stability1,"stability2"},3,4,"solidstate","hygroscopicity","particlesize","alcohosolubility","flowability",4,"saltfrom",5,"iconicity")	pass
2	Test get substance object which is contained in database by substance id.	2	(2,"substance1","watersolubility1",{stability3,"stability4"},5,7,"solidstate1","hygroscopicity1","particlesize1","alcohosolubility1","flowability1",5,"saltfrom1",8,"iconicity1")	(2,"substance1","watersolubility1",{stability3,"stability4"},5,7,"solidstate1","hygroscopicity1","particlesize1","alcohosolubility1","flowability1",5,"saltfrom1",8,"iconicity1")	pass
3	Test get substance object which is not contain in database by substance id.	3	null	null	pass
4	Test get substance object which is not contain by substance id in database.	4	Null	Null	pass

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2.2.2 ExcipientServiceImpl Class.

2.2.2.1 Unit Test Record for Server Side 06 (UTR-SV-06)

addExcipient(excipient : Excipient): Excipient

Case No.	Description	Input data	Expect Result	Actual Result	Status
		Excipient object	Excipient object	Excipient object	
1	Test excipient which is correct the formal excipient object.	(null,substance1,{substanceFunction1, substanceFunction1}, 1)	(not null, substance1 , { substanceFunction1, substanceFunction3} , 1)	(not null, substance1 , { substanceFunction1, substanceFunction3} , 1)	pass
2	Test add excipient which is correct the formal of excipient object.	(null, substance2 , { substanceFunction2, substanceFunction4} , 2)	(not null, substance4 , { substanceFunction2, substanceFunction4} , 2)	(not null, substance4 , { substanceFunction2, substanceFunction4} , 2)	pass
3	Test add excipient object which is contained in the database already.	("3", substance3 , { substanceFunction1, substanceFunction2} , 3)	null	null	pass
4	Test add excipient object which is contained in the database already.	("4", substance4, { substanceFunction3, substanceFunction4} , 4)	null	null	pass

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2.2.2.2 Unit Test Record for Server Side 07 (UTR-SV-07)

updateExcipient(excipient : Excipient) : Excipient

Case No.	Description	Input data	Expect Result	Actual Result	Status
		Excipient object	Excipient object	Excipient object	
1	Test update excipient which is correct the formal of object excipient and contained in the database.	("3", substance1, { substanceFunction1, substanceFunction2}, 5)	("3", substance1, { substanceFunction1, substanceFunction2}, 5)	("3", substance1, { substanceFunction1, substanceFunction2}, 5)	pass
2	Test update excipient which is correct the formal of excipient object and contained in the database.	("4", substance2, { substanceFunction3, substanceFunction4}, 7)	("4", substance2, { substanceFunction3, substanceFunction4}, 7)	("4", substance2, { substanceFunction3, substanceFunction4}, 7)	pass
3	Test update excipient which is not contained in the database.	("1", substance1, { substanceFunction1, substanceFunction2}, 4)	null	null	pass
4	Test update excipient which is not contained in the database.	("2", substance2, { substanceFunction3, substanceFunction4}, 9)	null	null	pass

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2.2.2.3 Unit Test Record for Server Side 08 (UTR-SV-08)

deleteExcipient (excipient : Excipient):Excipient

Case No.	Description	Input data	Expect Result	Actual Result	Status
		Excipient object	Excipient object	Excipient object	
1	Test delete excipient which is contained in database.	("3" , substance3 , { substanceFunction1, substanceFunction2} , 3)	(null, substance3 , {substanceFunction1, substanceFunction2} , 3)	(null, substance3 , {substanceFunction1, substanceFunction2} , 3)	pass
2	Test delete excipient which is contained in database.	("4" , substance4 , { substanceFunction3, substanceFunction4} , 4)	(null , substance4, {substanceFunction3, substanceFunction4} , 4)	(null , substance4, {substanceFunction3, substanceFunction4} , 4)	pass
3	Test delete excipient which is not contained in database.	("1" , substance1 , { substanceFunction3, substanceFunction4} , 5)	null	null	pass
4	Test delete excipient which is not contained in database.	("2" , substance2 , { substanceFunction1, substanceFunction2} , 7)	null	null	pass

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2.2.2.4 Unit Test Record for Server Side 09 (UTR-SV-09)

getExcipientById (id : String) : Excipient

case	Description	Input	Expect result	Actual Result	Status
		Id	Excipient object	Excipient object	
1	Test get excipient object by excipient id.	"3"	("3" , substance3 , { substanceFunction1, substanceFunction2} , 3)	("3" , substance3 , { substanceFunction1, substanceFunction2} , 3)	pass
2	Test get excipient object by excipient id.	"4"	("4" , substance4, { substanceFunction3, substanceFunction4} , 4)	("4" , substance4, { substanceFunction3, substanceFunction4} , 4)	pass
3	Test get excipient object which is not contain in database.	1	null	null	pass
4	Test get excipient object which is not contain in database.	2	null	null	pass

2.2.2.5 Unit Test Record for Server Side 10 (UTR-SV-10)

getSubstaneFunction() : SubstanceFunction []

case	Description	Expect result	Expect result	Status
		Excipient object List	Excipient object List	
1	Test get all substanceFunction list.	{ substanceFunction1, substanceFunction2, substanceFunction3, substanceFunction4}	{ substanceFunction1, substanceFunction2, substanceFunction3, substanceFunction4}	pass

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2.2.2.6 Unit Test Record for Server Side 11 (UTR-SV-11)

getSubstanceForExcipient() : Substance[]

case	Description	Expect result	Actual Result	Status
		Excipient object List	Excipient object List	
1	Test get all substance list that.	{ substance1, substanc2, substance3, substance4}	{ substance1, substanc2, substance3, substance4}	pass

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2.2.3 FormulationServiceImpl Class.

2.2.3.1 Unit Test Record for Server Side 12 (UTR-SV-12)

addFormulation (formulation: Formulation): Formulation

Case No.	Description	Input data	Expect Result	Actual Result	Status
		Formulation object	Formulation object	Formulation object	
1	Test add formulation object which is correct the formal of formulation object.	(null , "name1", "type1", 1, {excipient1,excipient2})	(not null , "name1", "type1", 1, {excipient1,excipient2})	(not null , "name1", "type1", 1, {excipient1,excipient2})	pass
2	Test add formulation which is correct the formal of formulation object.	(null , "name4", "type4", 4, {excipient3,excipient4})	(not null, "name4", "type4", 4, {excipient3,excipient4})	(not null, "name4", "type4", 4, {excipient3,excipient4})	pass
3	Test add formulation object which is contained in the database already.	("3" , "name3", "type3", 3, {excipient1,excipient2})	null	null	pass
4	Test add formulation object which is contained in the database already.	("4" , "name4", "type4", 4, {excipient3,excipient4})	null	null	pass

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2.2.3.2 Unit Test Record for Server Side 13 (UTR-SV-13)

updateFormulation(formulation : Formulation) : Formulation

Case No.	Description	Input data	Expect Result	Actual Result	Status
		formulation object	formulation object	formulation object	
1	Test update formulation object which is correct the formal of formulation object.	("3" , "name1" , "type1" , 1, {excipient3,excipient4})	("3" , "name1" , "type1" , 1, {excipient3,excipient4})	("3" , "name1" , "type1" , 1, {excipient3,excipient4})	pass
2	Test update formulation object which is correct the formal of formulation object.	("4" , "name2" , "type2" , 2, {excipient1,excipient2})	("4" , "name2" , "type2" , 2, {excipient1,excipient2})	("4" , "name2" , "type2" , 2, {excipient1,excipient2})	pass
3	Test update formulation object which is not contained in the database.	("1" , "name1" , "type1" , 1, {excipient1,excipient2})	null	null	pass
4	Test update formulation object which is not contained in the database.	("2" , "name2" , "type2" , 2, {excipient3,excipient4})	null	null	pass

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2.2.3.3 Unit Test Record for Server Side 14 (UTR-SV-14)

deleteFormulation (formulation: Formulation): Formulation

Case No.	Description	Input data	Expect Result	Expect Result	Status
		formulation object	formulation object	formulation object	
1	Test delete formulation object which is contained in database and correct format formulation object.	("3" , "name3" , "type3" , 3, {excipient1,excipient2})	("3" , "name3" , "type3" , 3, {excipient1,excipient2})	("3" , "name3" , "type3" , 3, {excipient1,excipient2})	pass
2	Test delete formulation object which is contained in database and correct format formulation object.	("4" , "name4" , "type4" , 4, {excipient3,excipient4})	("4" , "name4" , "type4" , 4, {excipient3,excipient4})	("4" , "name4" , "type4" , 4, {excipient3,excipient4})	pass
3	Test delete formulation object which is not contained in database.	("1" , "name1" , "type1" , 1, {excipient1,excipient1})	null	null	pass
4	Test delete formulation object which is not contained in database.	("2" , "name2" , "type2" , 2, {excipient3,excipient4})	null	null	pass

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2.2.3.4 Unit Test Record for Server Side 15 (UTR-SV-15)

getAllFormulation() : Formulation []

case	Description	Expect result	Actual Result	Status
		List formulation object	List formulation object	
1	Test get all formulation object list.	{formulation1,formulation2}	{formulation1,formulation2}	pass

2.2.3.5 Unit Test Record for Server Side 16 (UTR-SV-16)

getFormulationById(id : String) : Formulation

case	Description	Input	Expect result	Actual Result	Status
		Id	formulation object	formulation object	
1	Test get formulation object by formulation id.	3	("3" , "name3", "type3", 3, {excipient1,excipient2})	("3" , "name3", "type3", 3, {excipient1,excipient2})	pass
2	Test get formulation object by formulation id.	4	("4" , "name4", "type4", 4, {excipient3,excipient4})	("4" , "name4", "type4", 4, {excipient3,excipient4})	pass
3	Test get formulation object which is not contain in database.	1	null	null	pass
4	Test get formulation object which is not contain in database.	2	null	null	pass

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2.2.4 ReformulationHistoryServiceimpl Class.

2.2.4.1 Unit Test Record for Server Side 17 (UTR-SV-17)

createHistory(reformulationHistory : ReformulationHistory) : ReformulationHistory

Case No.	Description	Input data	Expect Result	Actual Result	status
		reformulationHistory object	reformulationHistory object	reformulationHistory object	
1	Test add reformulationHistory object which is correct the formal of reformulationHistory object.	(null, {reformulatedProduction1, reformulatedProduction3},"4/11/209 ", user1)	(null, {reformulatedProduction1, reformulatedProduction3},"4/11/209 ", user1)	(null, {reformulatedProduction1, reformulatedProduction3},"4/11/209 ", user1)	pass
2	Test add reformulationHistory object which is correct the formal of reformulationHistory object.	(null, {reformulatedProduction2, reformulatedProduction4},"6/6/2013 ", user2)	(null, {reformulatedProduction2, reformulatedProduction4},"6/6/2013 ", user2)	(null, {reformulatedProduction2, reformulatedProduction4},"6/6/2013 ", user2)	pass
3	Test add reformulationHistory object which is contained in the database already.	("3", {reformulatedProduction1, reformulatedProduction2},"5/10/2014 ", user1)	null	null	pass
4	Test add reformulationHistory object which is contained in the database already.	("4", {reformulatedProduction3, reformulatedProduction4},"7/4/2008 ", user2)	null	null	pass

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2.2.4.2 Unit Test Record for Server Side 18 (UTR-SV-18)

updateHistory(reformulationHistory : ReformulationHistory) : ReformulationHistory

Case No.	Description	Input data	Expect Result	Expect Result	Status
		reformulationHistory object	reformulationHistory object	reformulationHistory object	
1	Test update reformulationHistory object which is correct the formal of reformulationHistory object and contained in the database.	("3", {reformulatedProduction1, reformulatedProduction3},"4/11/209 ", user1)	("3", {reformulatedProduction1, reformulatedProduction3},"4/11/209 ", user1)	("3", {reformulatedProduction1, reformulatedProduction3},"4/11/209 ", user1)	pass
2	Test update reformulationHistory object which is correct the formal of reformulationHistory object and contained in the database.	("4", {reformulatedProduction2, reformulatedProduction4},"6/6/2013 ", user2)	("4", {reformulatedProduction2, reformulatedProduction4},"6/6/2013 ", user2)	("4", {reformulatedProduction2, reformulatedProduction4},"6/6/2013 ", user2)	pass
3	Test update reformulationHistory object which is not contained in the database.	("1", {reformulatedProduction1, reformulatedProduction3},"4/11/209 ", user1)	null	null	pass
4	Test update reformulationHistory object which is not contained in the database.	("2", {reformulatedProduction2, reformulatedProduction4},"6/6/2013 ", user2)	null	null	pass

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2.2.4.3 Unit Test Record for Server Side 19 (UTR-SV-19)

removeHistory(String id) : ReformulationHistory

Case No.	Description	Input data	Expect Result	Actual Result	Status
		id	reformulationHistory object	reformulationHistory object	
1	Test delete reformulationHistory object which is contained in database and correct format reformulationHistory object.	"3"	("3", {reformulatedProduction1, reformulatedProduction2},"5/10/2014 ", user1)	("3", {reformulatedProduction1, reformulatedProduction2},"5/10/2014 ", user1)	pass
2	Test delete reformulationHistory object which is contained in database and correct format reformulationHistory.	"4"	("4", {reformulatedProduction3, reformulatedProduction4},"7/4/2008 ", user2)	("4", {reformulatedProduction3, reformulatedProduction4},"7/4/2008 ", user2)	pass
3	Test delete reformulationHistory object which is not contained in database or incorrect format reformulationHistory object.	"1"	null	null	pass
4	Test delete reformulationHistory object which is not contained in database or incorrect format reformulationHistory object.	"2"	null	null	pass

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2.2.4.4 Unit Test Record for Server Side 20 (UTR-SV-20)

getAllHistory() : ReformulationHistory

case	Description	Expect result	Actual result	Status
		List of reformulationHistory object	List of reformulationHistory object	
1	Test get all reformulationHistory list	{ reformulationHistory3, reformulationHistory3 }	{ reformulationHistory3, reformulationHistory3 }	Pass

2.2.4.5 Unit Test Record for Server Side 21 (UTR-SV-21)

getHistoryById(String id) : ReformulationHistory

case	Description	Input	Expect result	Actual result	Status
		Id	reformulationHistory	reformulationHistory	
1	Test get reformulationHistory object by reformulationHistory id.	3	("3", {reformulatedProduction1, reformulatedProduction2},"5/10/2014 ", user1)	("3", {reformulatedProduction1, reformulatedProduction2},"5/10/2014 ", user1)	pass
2	Test get reformulationHistory object by reformulationHistory id.	4	("4", {reformulatedProduction3, reformulatedProduction4},"7/4/2008 ", user2)	("4", {reformulatedProduction3, reformulatedProduction4},"7/4/2008 ", user2)	pass
3	Test get reformulationHistory which is not contain in database.	1	null	null	pass
4	Test get reformulationHistory which is not contain in database.	2	null	null	pass

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2.2.5 InferenceEngineDirector Class.

2.2.5.1 Unit Test Record for Server Side 22 (UTR-SV-22)

getReformulationResult(production : Production) : ReformulatedProduction []

case	Description	Input	Expect result	Actual result	Status
		Reformulation object	List of Reformulated Production object	List of Reformulated Production object	
1	Test get all reformulaProduction list	("1" , formulation1 , dfProperty1 , "instruction1" , 1.12)	{ reformulatedProduction1, reformulatedProduction2, reformulatedProduction3 , reformulatedProduction4 }	{ reformulatedProduction1, reformulatedProduction2, reformulatedProduction3 , reformulatedProduction4 }	pass

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