

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

Test Record

By

**Mr. Narongrit Saisuwan 542115017**

**Mr. Panupak Wichaidit 542115047**

Department of Software Engineering  
College of Arts, Media and Technology  
Chiang Mai University

Project Advisor

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**Dr. Chartchai Doungsa-ard**

## Document History

Document Name	Version	Status	Date	Viewable	Reviewer	Responsible
<b>Documents</b>						
<b>OEGP –Unit Test Record_ v.0.1.docx</b>	<b>0.1</b> • UTR 01 – UTR 60	Draft	July 5, 2014	NS, PW, CD	NS, PW	NS, PW
<b>OEGP –Test Record _v.0.2.docx</b>	<b>0.2</b> • UTR 60 – UTR 83	Draft	July 7, 2014	NS, PW, CD	NS, PW	NS, PW
<b>OEGP –Test Record _v.1.0.docx</b>	<b>1.0</b> • Update Test Record number	Release	July 7, 2014	NS, PW, CD	NS, PW	NS, PW
<b>OEGP –Test Record _v.1.1.docx</b>	<b>1.1</b> • Remove Substance Properties test record. • Add the reformulationHistory and inferenceEngineDirector record. • Updating number ordering.	Draft	October 21, 2014	NS, PW, CD	NS, PW	NS, PW

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## Chapter | 1 Unit Test Record

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

#### 1.1.1 SubstanceCtrl Class.

##### 1.1.1.1 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","particle size","alcohol solubility2","flowability2",4,"saltfrom2",5.34,"iconicity2"}	(not null,"substancename2","watersolubility2",{"stability1","stability2"},3.4,4.6,"solidstate2","hygroscopicity2","particle size2","alcohol solubility2","flowability2",4,"saltfrom2",5.34,"iconicity2"}	(not null,"substancename","watersolubility1",{"stability","stability1"},3,4,"solidstate","hygroscopicity","particle size","alcohol solubility","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","particle size1","alcohol solubility1","flowability1",4.34,"saltfrom1",5.90,"iconicity1"}	(not null,"substancename1","watersolubility1",{"stability3","stability4"},6.32,7.67,"solidstate1","hygroscopicity1","particle size1","alcohol solubility1","flowability1",4.34,"saltfrom1",5.90,"iconicity1"}	(not null,"substancename1","watersolubility1",{"stability3","stability4"},5,7,"solidstate1","hygroscopicity1","particle size1","alcohol solubility1","flowability1",5,"saltfrom1",8,"iconicity1"}	N/A
3	Test add substance object which is contained in the	{"3","substancename2","watersolubility2",{"stability1","stability2"},3.45,4.32,	null	null	N/A

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	database already.	"solidstate2","hygroscopicity2","particle size2","alcohol solubility2","flowability2",4.3,"saltfrom2",5.45,"iconicity2"}			
4	Test add substance object which is contained in the database already.	{"4","substance name3","water solubility3",{"stability3","stability4"},6.56,7.32,"solidstate3","hygroscopicity3","particle size3","alcohol solubility3","flowability3",4.56,"saltfrom3",5,"iconicity3"}	null	null	N/A

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### 1.1.1.2 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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### 1.1.1.3 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","alcohol solubility","flowability",4.78,"saltfrom",5.10,"iconicity")	("3","substanceName","watersolubility",{ "stability1","stability2"},3.43,4.67,"solidstate","hygroscopicity","particlesize","alcohol solubility","flowability",4.78,"saltfrom",5.10,"iconicity")	(null,"substanceName","watersolubility",{ "stability1","stability2"},3,4,"solidstate","hygroscopicity","particlesize","alcohol solubility","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","alcohol solubility1","flowability1",5.90,"saltfrom1",8.45,"iconicity1")	("4","substanceName1","watersolubility1",{ "stability3","stability4"},5.55,7.54,"solidstate1","hygroscopicity1","particlesize1","alcohol solubility1","flowability1",5.90,"saltfrom1",8.45,"iconicity1")	(null,"substanceName1","watersolubility1",{ "stability3","stability4"},5,7,"solidstate1","hygroscopicity1","particlesize1","alcohol solubility1","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","alcohol solubility2","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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#### 1.1.1.4 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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## 1.1.2 ExcipientCtrl Class.

### 1.1.2.1 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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### 1.1.2.2 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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### 1.1.2.3 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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#### 1.1.2.4 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

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

##### getSubstaneList() : 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

#### 1.1.2.6 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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### 1.1.3 FormulationCtrl Class.

#### 1.1.3.1 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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### 1.1.3.2 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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### 1.1.3.3 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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#### 1.1.3.4 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

#### 1.1.3.5 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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#### 1.1.4 FormulationCtrl Class.

##### 1.1.4.1 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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### 1.1.5 ReformulationHisCtrl Class.

#### 1.1.5.1 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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### 1.1.5.2 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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## 1.2 Unit Test Record for Server Side (UTR-SV).

### 1.2.1 SubstanceServiceImpl Class.

#### 1.2.1.1 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","alcoholsolubility","flowability",4,"saltfrom",5,"iconicity")	(not null,"substanceName","watersolubility1",{"stability","stability1"},3,4,"solidstate","hygroscopicity","particle size","alcoholsolubility","flowability",4,"saltfrom",5,"iconicity")	(not null,"substanceName","watersolubility1",{"stability","stability1"},3,4,"solidstate","hygroscopicity","particlesize","alcoholsolubility","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","alcoholsolubility1","flowability1",5,"saltfrom1",8,"iconicity1")	(not null,"substanceName1","watersolubility1",{"stability3","stability4"},5,7,"solidstate1","hygroscopicity1","particle size1","alcoholsolubility1","flowability1",5,"saltfrom1",8,"iconicity1")	(not null,"substanceName1","watersolubility1",{"stability3","stability4"},5,7,"solidstate1","hygroscopicity1","particle size1","alcoholsolubility1","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","alcoholsolubility2",	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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### 1.2.1.2 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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### 1.2.1.3 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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#### 1.2.1.4 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

#### 1.2.1.5 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,"substancename","watersolubility",{ "stability1","stability2"},3,4,"solidstate","hygroscopicity","particlesize","alcohosolubility","flowability",4,"saltfrom",5,"iconicity")	(1,"substancename","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,"substancename1","watersolubility1",{ "stability3","stability4"},5,7,"solidstate1","hygroscopicity1","particlesize1","alcohosolubility1","flowability1",5,"saltfrom1",8,"iconicity1")	(2,"substancename1","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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## 1.2.2 ExcipientServiceImpl Class.

### 1.2.2.1 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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### 1.2.2.2 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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### 1.2.2.3 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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#### 1.2.2.4 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

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

##### **getSubstanceFunction() : 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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1.2.2.6 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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### 1.2.3 FormulationServiceImpl Class.

#### 1.2.3.1 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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### 1.2.3.2 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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### 1.2.3.3 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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#### 1.2.3.4 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

#### 1.2.3.5 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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## 1.2.4 ReformulationHistoryServiceimpl Class.

### 1.2.4.1 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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#### 1.2.4.2 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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### 1.2.4.3 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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#### 1.2.4.4 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

#### 1.2.4.5 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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## 1.2.5 InferenceEngineDirector Class.

### 1.2.5.1 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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