

More on Validation

The appendix is divided into two main sections, the first section contains the UML digrams, for each diagram we have:

- Base, version 1, and version 2 figuers.
- Changes from base version to version 1 & from base version to version 2.
- Stability Calculations.

The UML digrams are:

1. UML Class Diagrams
 - a. ATM
 - b. O-RED
 - c. SCM
2. UML Use Case Diagrams
 - a. HOSS
 - b. ORA
3. UML Sequence Diagrams.
 - a. Deposit.
 - b. Withdraw

The second section contains the experiment results from the subjects.

UML Class Diagrams

1. ATM

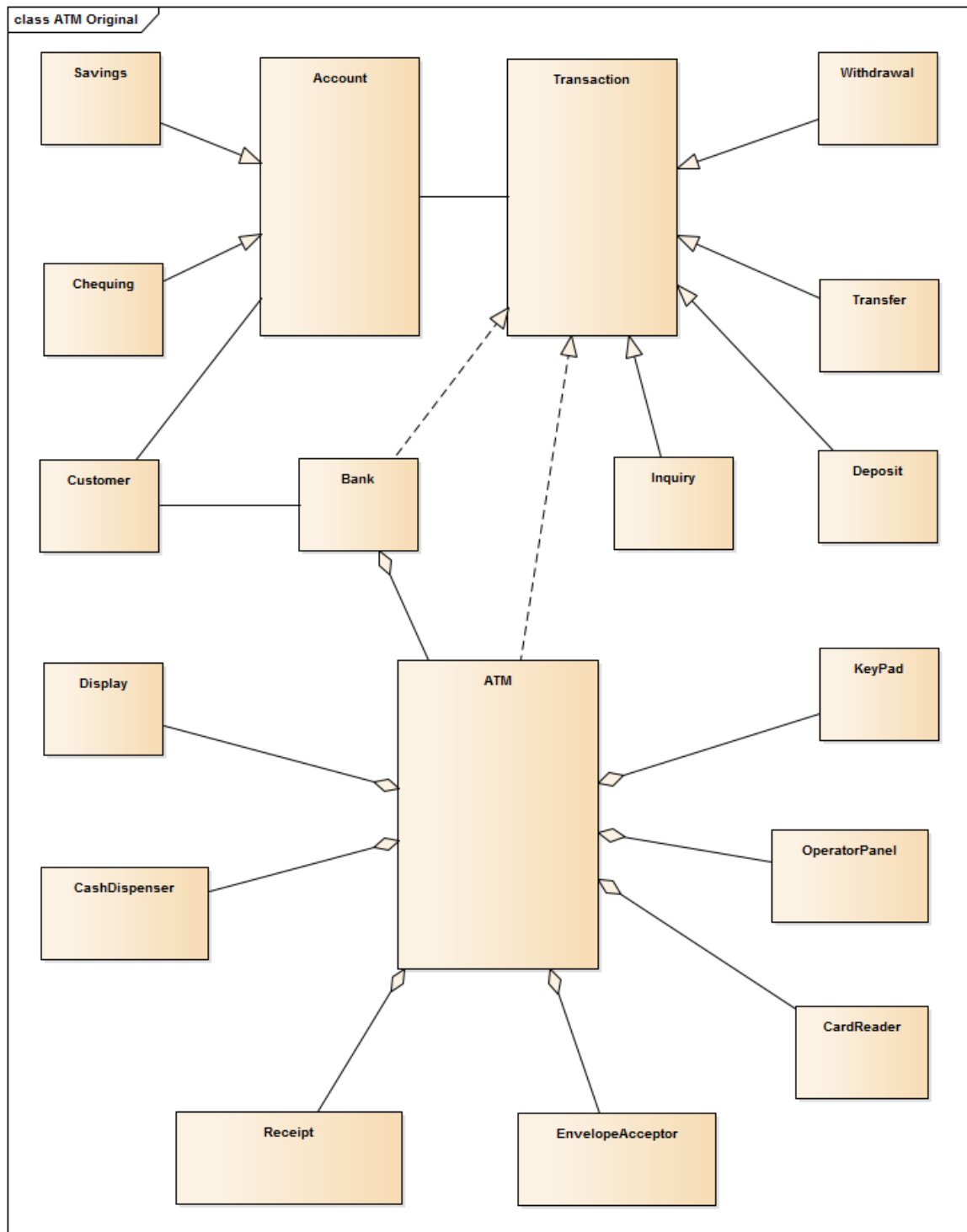


Figure 1 ATM Base Version

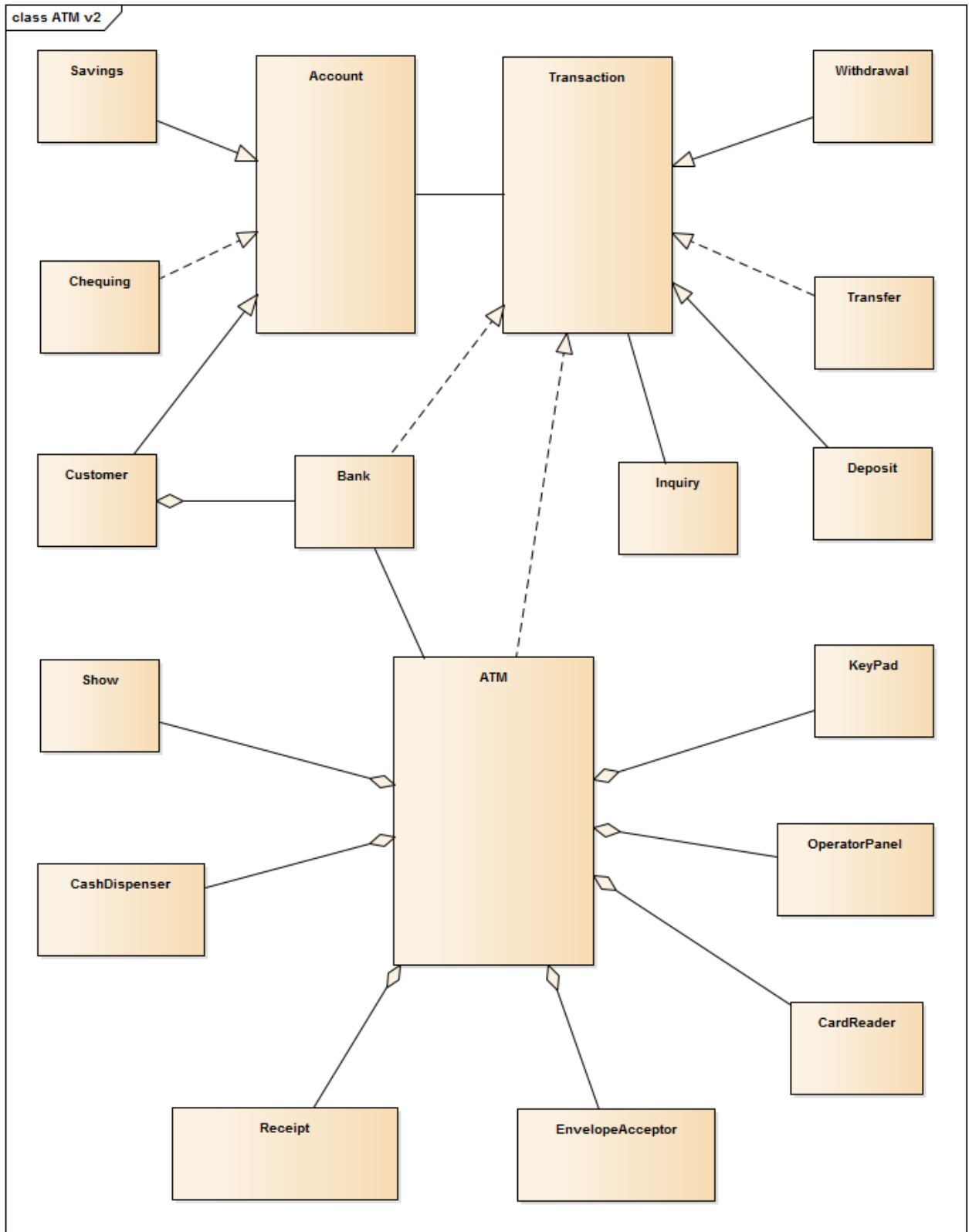


Figure 2 ATM Version 1

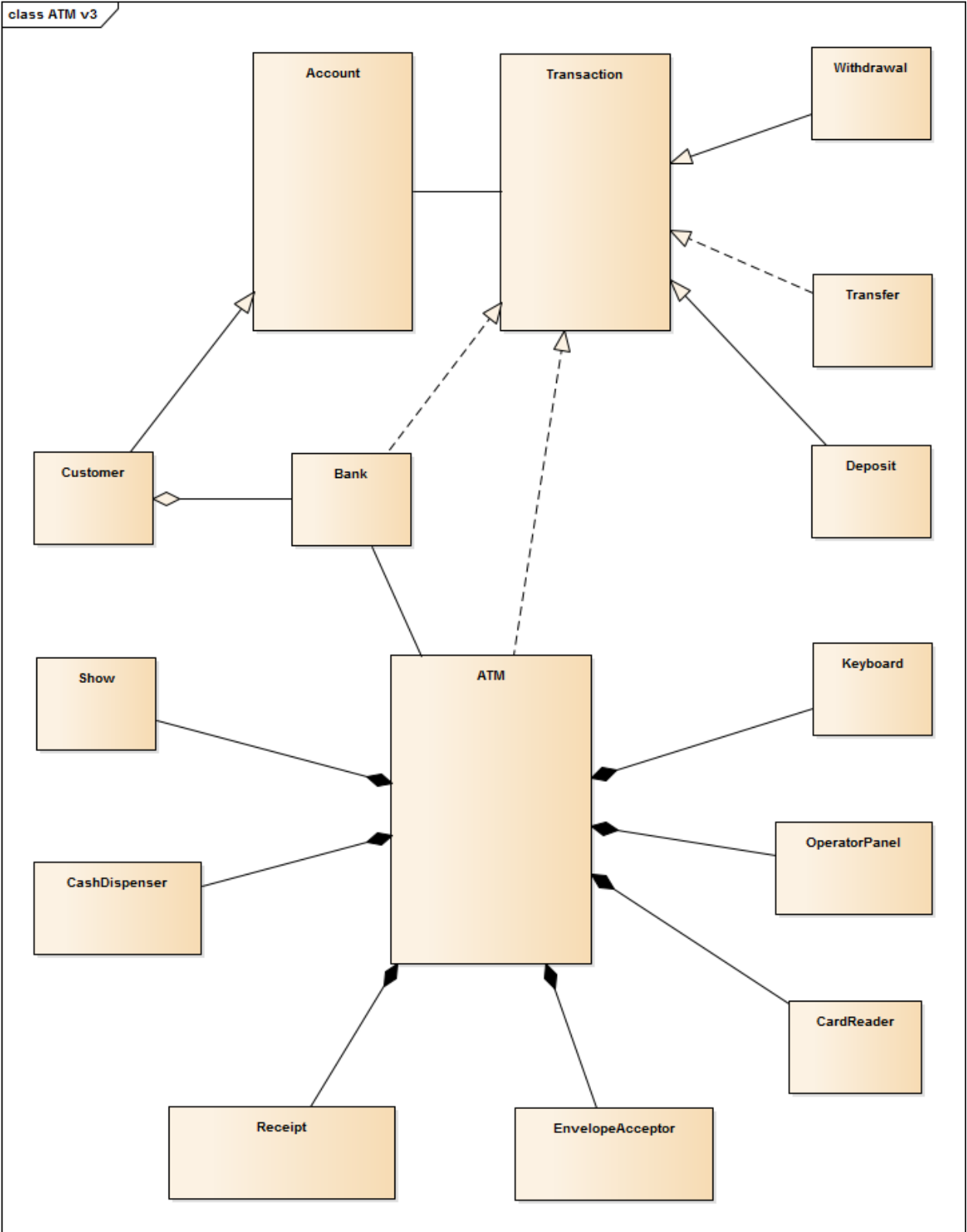


Figure 3 ATM version 2

Table 1 Changes from base version to version 1 & from base version to version 2

Classifier Name	Base Version		Version 1		Version 2	
	Classifier Type	Classifier Relationships	Classifier Type	Classifier Relationships	Classifier Type	Classifier Relationships
Savings	Class	Account-INH	Class	Account-INH	DELETED	
Account	Class	Customer-ASO	Interface	-	Class	-
		Transaction-ASO		Transaction-ASO		Transaction-ASO
Transaction	Interface	Account-ASO	Interface	Account-ASO	Interface	Account-ASO
				Inquiry-ASO		
Withdrawal	Class	Transaction-INH	Class	Transaction-INH	Class	Transaction-INH
Chequing	Class	Account-INH	Class	Account-REA	DELETED	
Transfer	Class	Transaction-INH	Class	Transaction-REA	Class	Transaction-REA
Customer	Class	Account-ASO	Class	Account-INH	Class	Account-INH
		Bank-ASO		Bank-AGG		Bank-AGG
Bank	Class	Customer-ASO	Class	-	Class	-
		Transaction-REA		Transaction-REA		Transaction-REA
		ATM-AGG		ATM-ASO		ATM-ASO
Inquiry	Class	Transaction-INH	Class	Transaction-ASO	DELETED	
Deposit	Class	Transaction-INH	Class	Transaction-INH	Class	Transaction-INH
Display	Class	-	DELETED		DELETED	
ATM	Class	Display-AGG	Class	Show-AGG	Class	Show-AGG
		CashDispenser-AGG		CashDispenser-AGG		CashDispenser-COM
		Receipt-AGG		Receipt-AGG		Receipt-COM
		EnvelopeAccept or-AGG		EnvelopeAccept or-AGG		EnvelopeAccept or-COM
		CardReader-AGG		CardReader-AGG		CardReader-COM
		OperatorPanel-AGG		OperatorPanel-COM		OperatorPanel-COM
		KeyPad-AGG		KeyPad-AGG		KeyPad-COM
KeyPad	Class	-	Class	-	Class	-
CashDispenser	Class	-	Class	-	Class	-
OperatorPanel	Class	-	Class	-	Class	-
Receipt	Class	-	Class	-	Class	-
EnvelopeAccept or	Class	-	Class	-	Class	-
CardReader	Class	-	Class	-	Class	-

Table 2 Stability Calculations

Classifier Name	No. of v1 changed Properties	No. of v2 changed Properties	No. of v1 Unique Properties	No. of v2 Unique Properties	v1 changed Average	v2 changed Average
Savings	0	2	2	2	0	1
Account	1	1	3	3	0.333333	0.333333
Transaction	1	1	3	3	0.333333333	0.333333333
Withdrawal	0	0	2	2	0	0
Chequing	1	2	2	2	0.5	1
Transfer	1	1	2	2	0.5	0.5
Customer	2	2	3	3	0.666667	0.666667
Bank	2	2	4	4	0.5	0.5
Inquiry	1	2	2	2	0.5	1
Deposit	0	0	2	2	0	0
Display	1	1	1	1	1	1
ATM	3	8	9	9	0.333333	0.888889
KeyPad	0	0	1	1	0	0
CashDispenser	0	0	1	1	0	0
OperatorPanel	0	0	1	1	0	0
Receipt	0	0	1	1	0	0
EnvelopeAcceptor	0	0	1	1	0	0
CardReader	0	0	1	1	0	0
SUM					4.666666667	7.222222222
Instability					0.259259259	0.401234568
Stability					0.740740741	0.598765432

2. O-RED System

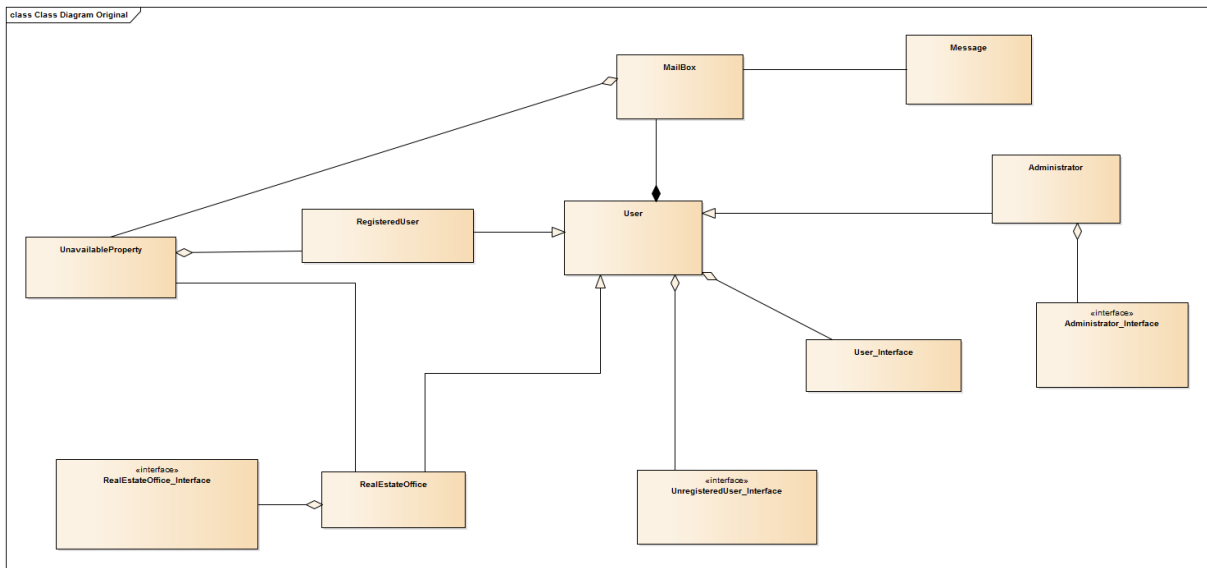


Figure 4 O-RED Base Version

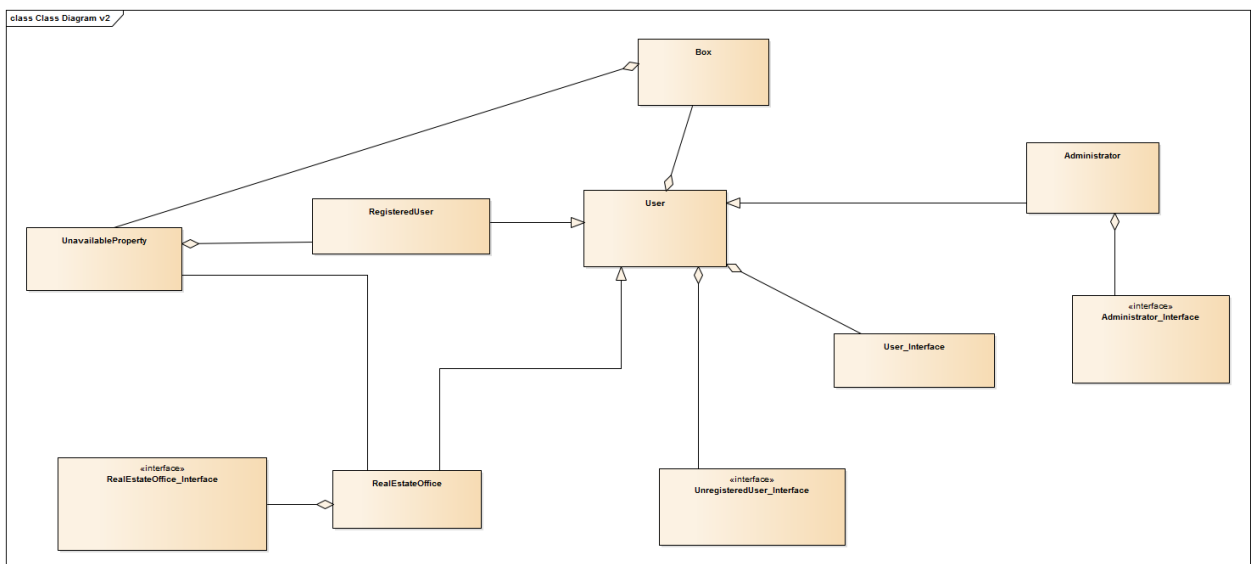


Figure 5 O-RED version 1

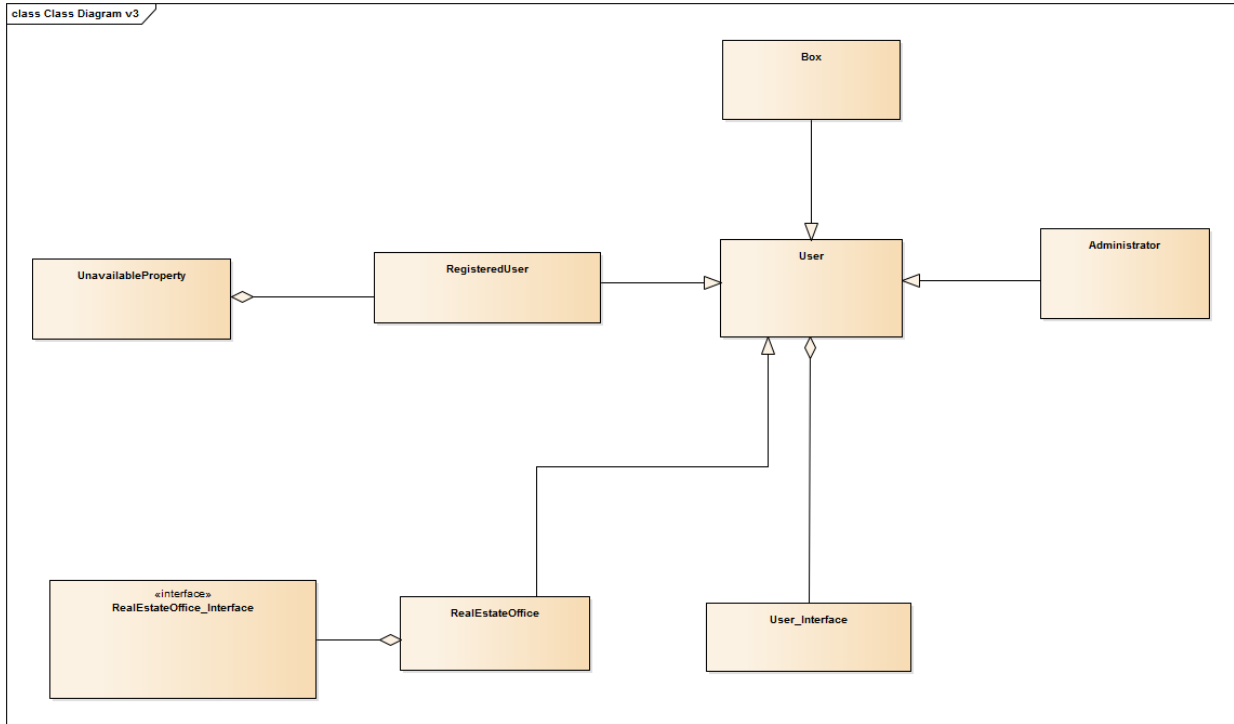


Figure 6 O-RED version 2

Table 3 Changes from base version to version 1 & from base version to version 2

Classifier Name	Base Version		Version 1		Version 2	
	Classifier Type	Classifier Relationships	Classifier Type	Classifier Relationships	Classifier Type	Classifier Relationships
MailBox	Class	Message-ASO UnavailableProperty-AGG	DELETED		DELETED	
Message	Class	MailBox-ASO	DELETED		DELETED	
UnavailableProperty	Class	RegisteredUser-AGG RealEstateOffice-ASO	Class	RegisteredUser-AGG RealEstateOffice-ASO	Class	RegisteredUser-AGG -
RegisteredUser	Class	User-INH	Class	User-INH	Class	User-INH
User	Class	MailBox-COM User_Interface-AGG UnregisteredUser_Interface-AGG	Class	Box-AGG User_Interface-AGG UnregisteredUser_Interface-AGG	Class	- User_Interface-AGG -
Administrator	Class	User-INH Administrator_Interface-AGG	Class	User-INH Administrator_Interface-AGG	Class	User-INH -
Administrator_Interface	Interface	-	Interface	-	DELETED	
User_Interface	Interface	-	Interface	-	Interface	-
UnregisteredUser_Interface	Interface	-	Interface	-	DELETED	
RealEstateOffice	Class	User-INH	Class	User-INH	Class	User-INH

		UnavailableProperty-ASO		UnavailableProperty-ASO		-
		RealEstateOffice_Interface-AGG		RealEstateOffice_Interface-AGG		RealEstateOffice_Interface-AGG
RealEstateOffice_Interface	Interface	-	Interface	-	Interface	-
Box	-	-	Class	-	Class	User-INH

Table 4 Stability Calculations

Classifier Name	No. of v1 changed Properties	No. of v2 changed Properties	No. of v1 Unique Properties	No. of v2 Unique Properties	v1 changed Average	v2 changed Average
MailBox	3	3	3	3	1	1
Message	2	2	2	2	1	1
UnavailableProperty	0	1	3	3	0.333333333	0.333333333
RegisteredUser	0	0			0	0
User	2	3	4	4	0.5	0.75
Administrator	0	1	3	3	0	0.333333333
Administrator_Interface	0	1	1	1	0	1
User_Interface	0	0	1	1	0	0
UnregisteredUser_Interface	0	1	1	1	0	1
RealEstateOffice	0	1	4	4	0	0.25
RealEstateOffice_Interface	0	0	1	1	0	0
Box	0	1	1	1	0	1
SUM					2.833333333	6.666666667
Instability					0.236111111	0.555555556
Stability					0.763888889	0.444444444

3. SCM System

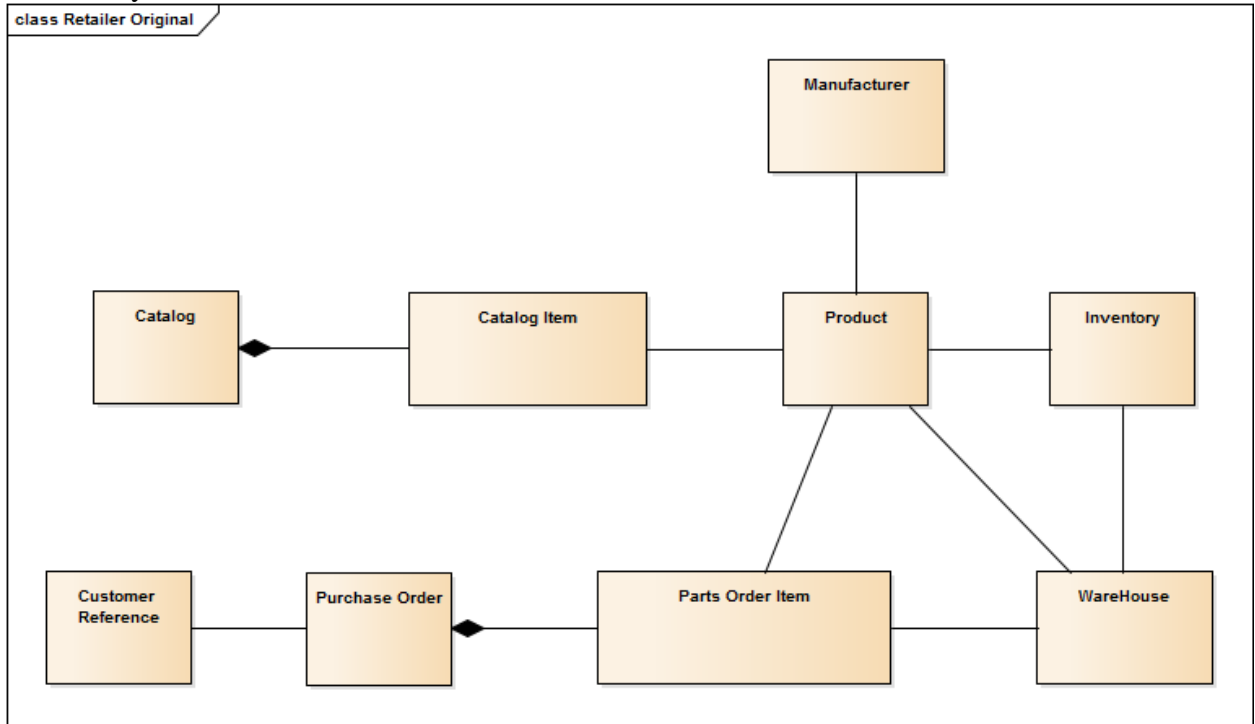


Figure 7 SCM Base Version

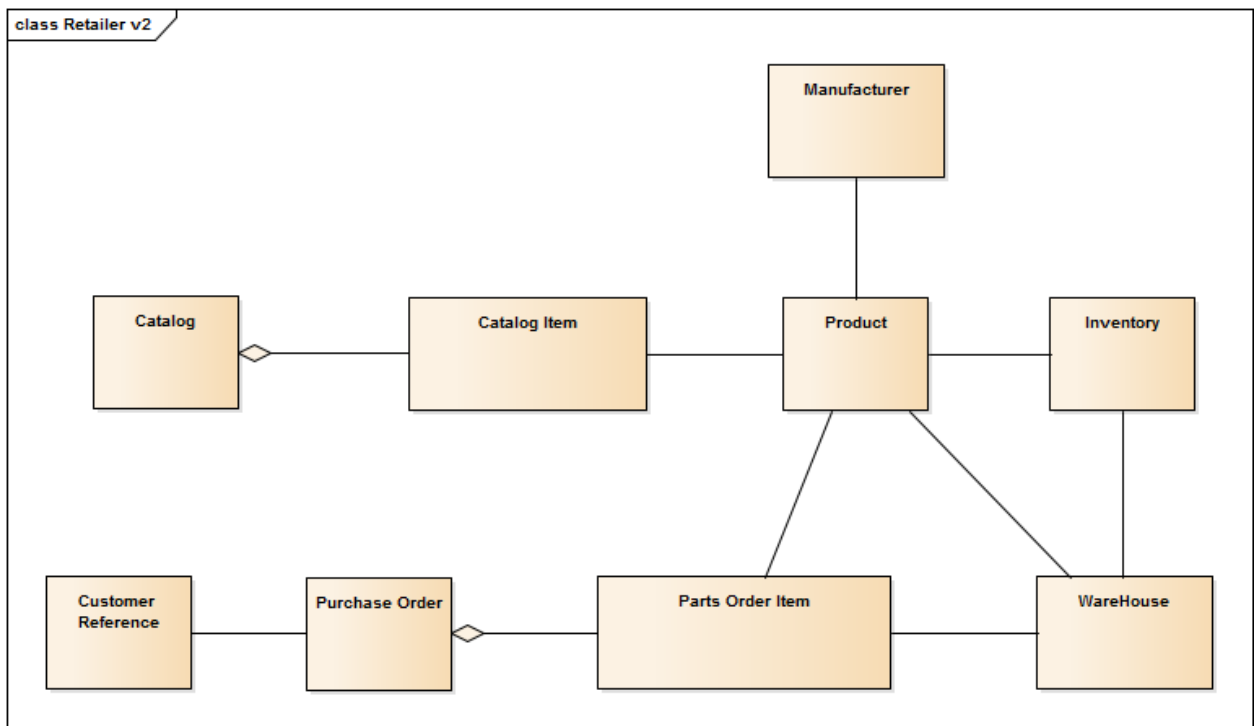


Figure 8 SCM version 1

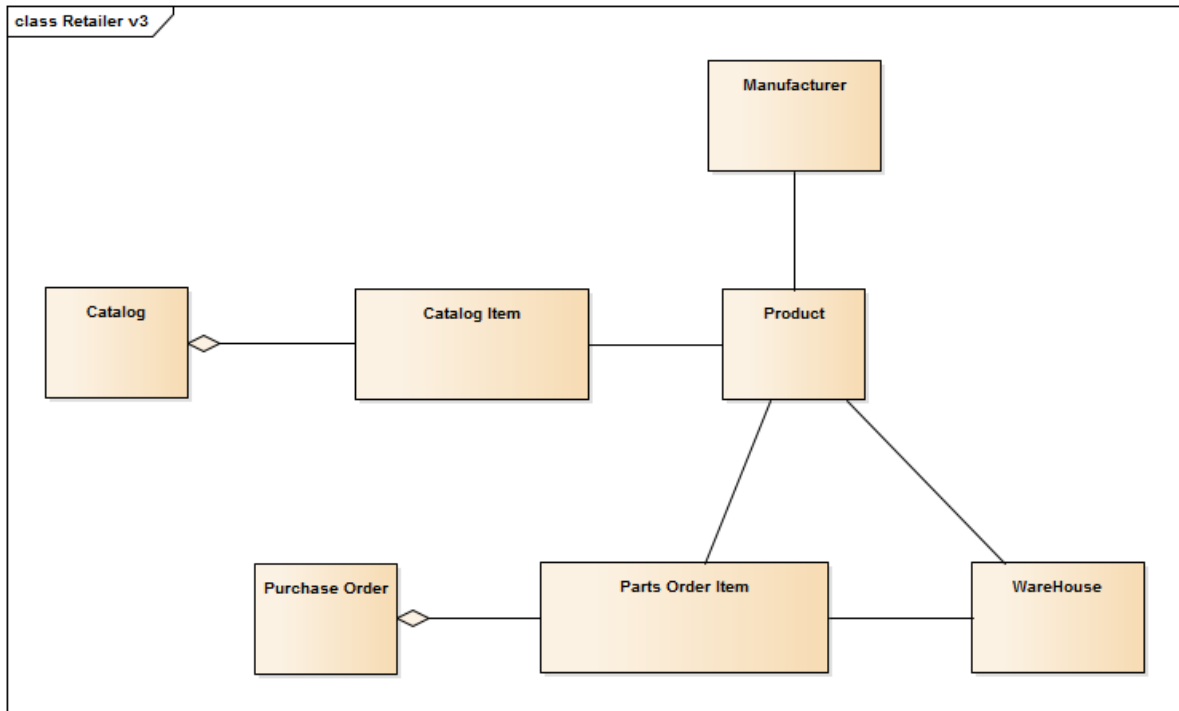


Figure 9 SCM version 2

Table 5 Changes from base version to version 1 & from base version to version 2

Classifier Name	Base Version		Version 1		Version 2	
	Classifier Type	Classifier Relationships	Classifier Type	Classifier Relationships	Classifier Type	Classifier Relationships
Manufacturer	Class	Product-ASO	Class	-	Class	Product-ASO
		-		-		-
Catalog	Class	CatalogItem-COM	Class	CatalogItem-AGG	Class	CatalogItem-AGG
Catalog Item	Class	Product-ASO	Class	Product-ASO	Class	Product-ASO
Product	Class	CatalogItem-ASO	Class	CatalogItem-ASO	Class	CatalogItem-ASO
		Inventory-ASO		Inventory-ASO		-
		Manufacturer-ASO		Manufacturer-ASO		Manufacturer-ASO
		PartsOrderItem-ASO		PartsOrderItem-ASO		PartsOrderItem-ASO
		WareHouse-ASO		WareHouse-ASO		WareHouse-ASO
Inventory	Class	Product-ASO	Class	Product-ASO	DELETED	
		WareHouse-ASO		WareHouse-ASO		
Customer Reference	Class	PurchaseOrder-ASO	Class	PurchaseOrder-ASO	DELETED	
Purchase Order	Class	CustomerReference-ASO	Class	CustomerReference-ASO	Class	-
		PartsOrderItem-COM		PartsOrderItem-AGG		PartsOrderItem-AGG
		-		-		-
Parts Order Item	Class	Product-ASO	Class	Product-ASO	Class	Product-ASO
		WareHouse-ASO		WareHouse-ASO		WareHouse-ASO

WareHouse	Class	Inventory-ASO	Class	Inventory-ASO	Class	-
		Product-ASO		Product-ASO		Product-ASO
		PartsOrderItem-ASO		PartsOrderItem-ASO		PartsOrderItem-ASO

Table 6 Stability Calculations

Classifier Name	No. of v1 changed Properties	No. of v2 changed Properties	No. of v1 Unique Properties	No. of v2 Unique Properties	v1 changed Average	v2 changed Average
Manufacturer	1	0	2	2	0.5	0
Catalog	1	1	2	2	0.5	0.5
Catalog Item	0	0	2	2	0	0
Product	0	1	6	6	0	0.166666667
Inventory	0	3	3	3	0	1
Customer Reference	0	2	2	2	0	1
Purchase Order	1	2	3	3	0.333333333	0.666666667
Parts Order Item	0	0	3	3	0	0
WareHouse	0	1	4	4	0	0.25
SUM					1.333333333	3.583333333
Instability					0.148148148	0.398148148
Stability					0.851851852	0.601851852

UML Use Case Diagrams

1. HOSS System

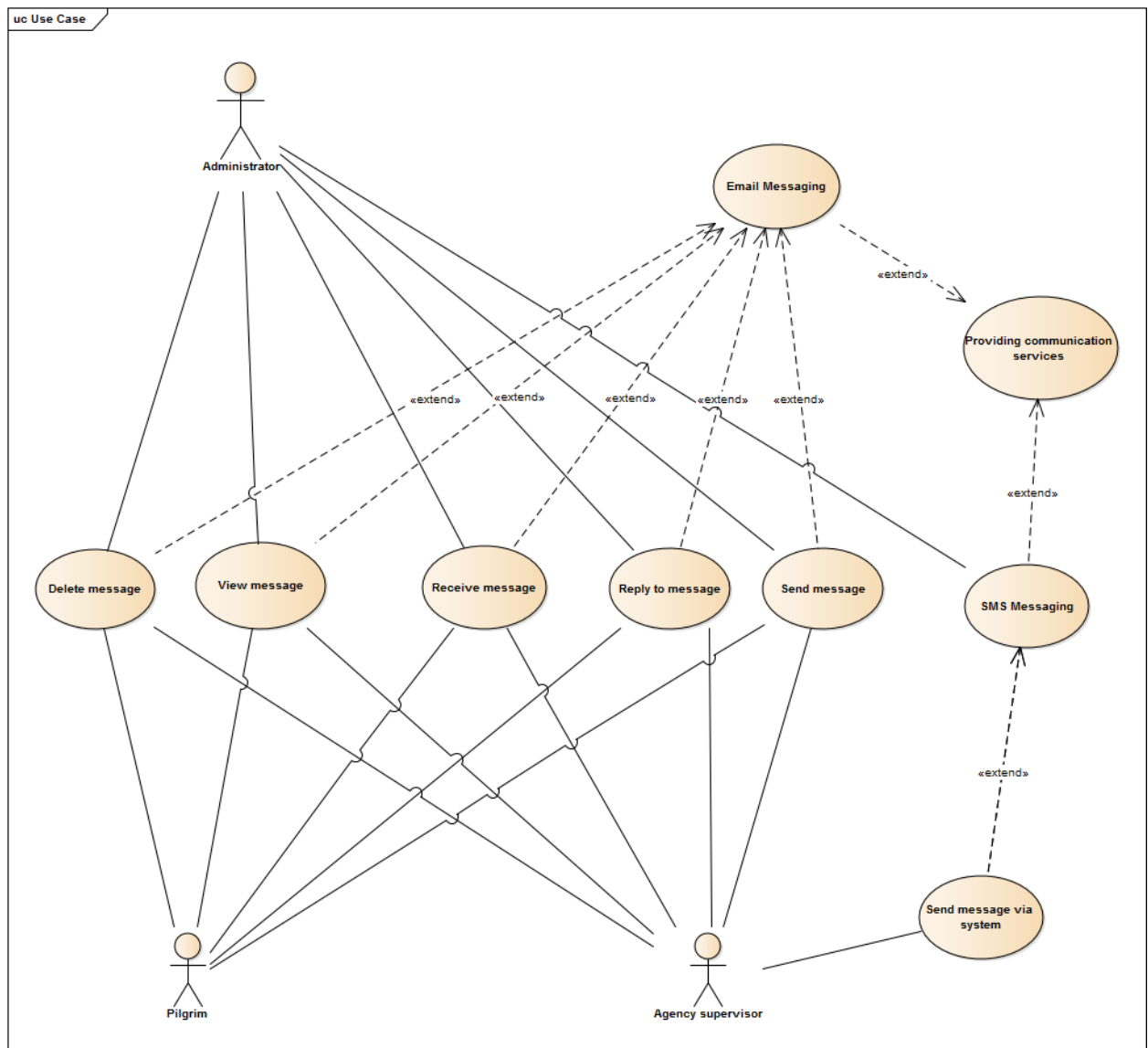


Figure 10 HOSS Base version

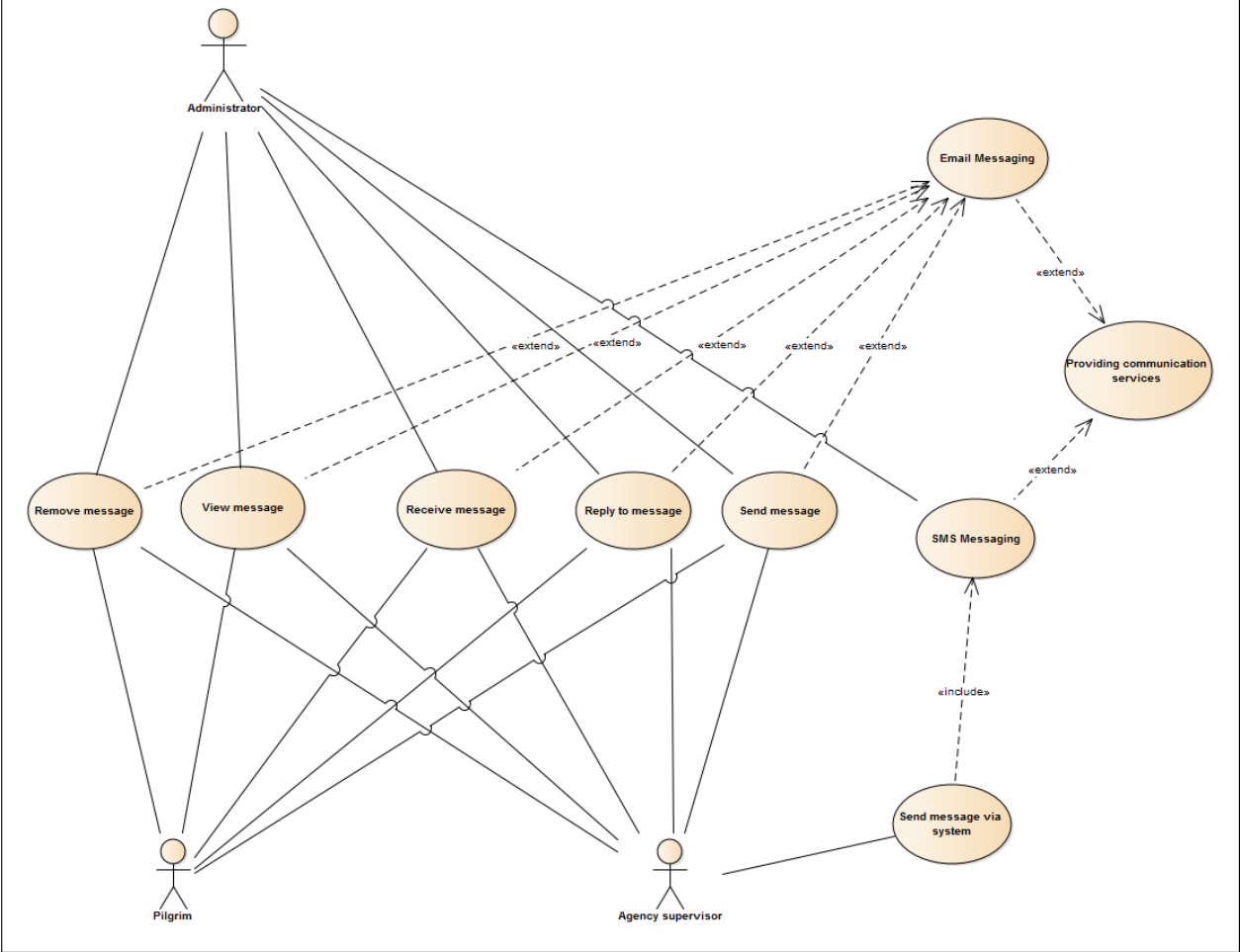


Figure 11 HOSS version 1

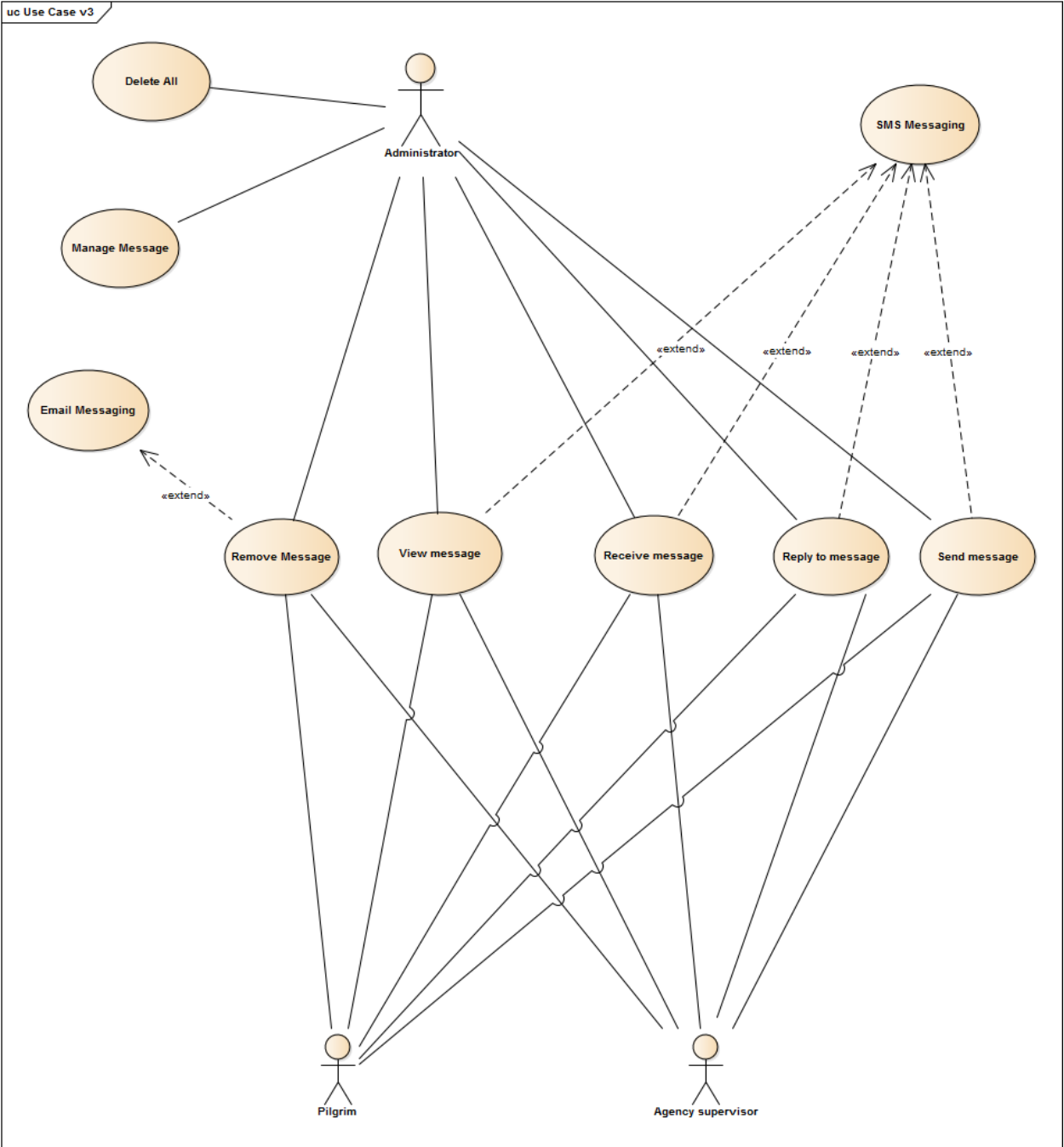


Figure 12 HOSS version 2

Table 7 Changes from base version to version 1 & from base version to version 2

Identifier Name	Version 1		Version 2	
	Identifier Type	Identifier Relationships	Identifier Type	Identifier Relationships
Administrator	Actor	Delete message-ASO	Actor	-
		View message-ASO		View message-ASO
		Receive message-ASO		Receive message-ASO
		Reply to message-ASO		Reply to message-ASO
		Send message-ASO		Send message-ASO
		SMS Messaging-ASO		-
		-		Manage messages-ASO
		-		Remove Message-ASO
Delete message	DELETED - Change the name to Remove Message			
View message	Use Case	Administrator-ASO	Use Case	Administrator-ASO
		Pilgrim-ASO		Pilgrim-ASO
		Agency supervisor-ASO		Agency supervisor-ASO
		Email Messaging-EX		-
		-		SMS Messaging-EX
Receive message	Use Case	Administrator-ASO	Use Case	Administrator-ASO
		Pilgrim-ASO		Pilgrim-ASO
		Agency supervisor-ASO		Agency supervisor-ASO
		Email Messaging-EX		-
		-		SMS Messaging-EX
Reply to message	Use Case	Administrator-ASO	Use Case	Administrator-ASO
		Pilgrim-ASO		Pilgrim-ASO
		Agency supervisor-ASO		Agency supervisor-ASO
		Email Messaging-EX		-
		-		SMS Messaging-EX
Send message	Use Case	Administrator-ASO	Use Case	Administrator-ASO
		Pilgrim-ASO		Pilgrim-ASO
		Agency supervisor-ASO		Agency supervisor-ASO
		Email Messaging-EX		-
		-		SMS Messaging-EX
Pilgrim	Actor	Delete message-ASO	Actor	-
		View message-ASO		View message-ASO
		Receive message-ASO		Receive message-

				ASO
		Reply to message-ASO		Reply to message-ASO
		Send message-ASO		Send message-ASO
		-		Delete All - ASO
		-		Remove Message - ASO
Agency supervisor	Actor	Delete message-ASO	Actor	-
		View message-ASO		View message-ASO
		Receive message-ASO		Receive message-ASO
		Reply to message-ASO		Reply to message-ASO
		Send message-ASO		Send message-ASO
		Send message via system-ASO		Send message via system-ASO
		-		Delete All - ASO
		-		Remove Message - ASO
SMS Messaging	Use Case with Extension Point	Administrator-ASO	Use Case with Extension Point	Administrator-ASO
		Providing communication services-EX		-
Email Messaging	Use Case with Extension Point	Providing communication services-EX	Use Case with Extension Point	-
Send message via system	DELETED			
Providing communication services	DELETED			

Table 8 Stability Calculations

Classifier Name	No. of v1 changed Properties	No. of v2 changed Properties	No. of v1 Unique Properties	No. of v2 Unique Properties	v1 changed Average	v2 changed Average
Administrator	2	5	9	9	0.22222222	0.55555556
Delete message	FULL	FULL	-	-	1	1
View message	0	2	6	6	0	0.33333333
Receive message	0	2	6	6	0	0.33333333
Reply to message	0	2	6	6	0	0.33333333
Send message	0	2	6	6	0	0.33333333
Pilgrim	2	3	8	8	0.25	0.33333333
Agency supervisor	2	3	9	9	0.22222222	0.33333333
SMS Messaging	0	1	3	3	0	0
Email Messaging	0	1	2	2	0	0.5
Send message via system	FULL	FULL	-	-	1	1
Providing communication services	FULL	FULL	-	-	1	1
SUM					3.47222222	5.5
Instability					0.289351852	0.458333333
Stability					0.710648148	0.541666667

2. ORA System

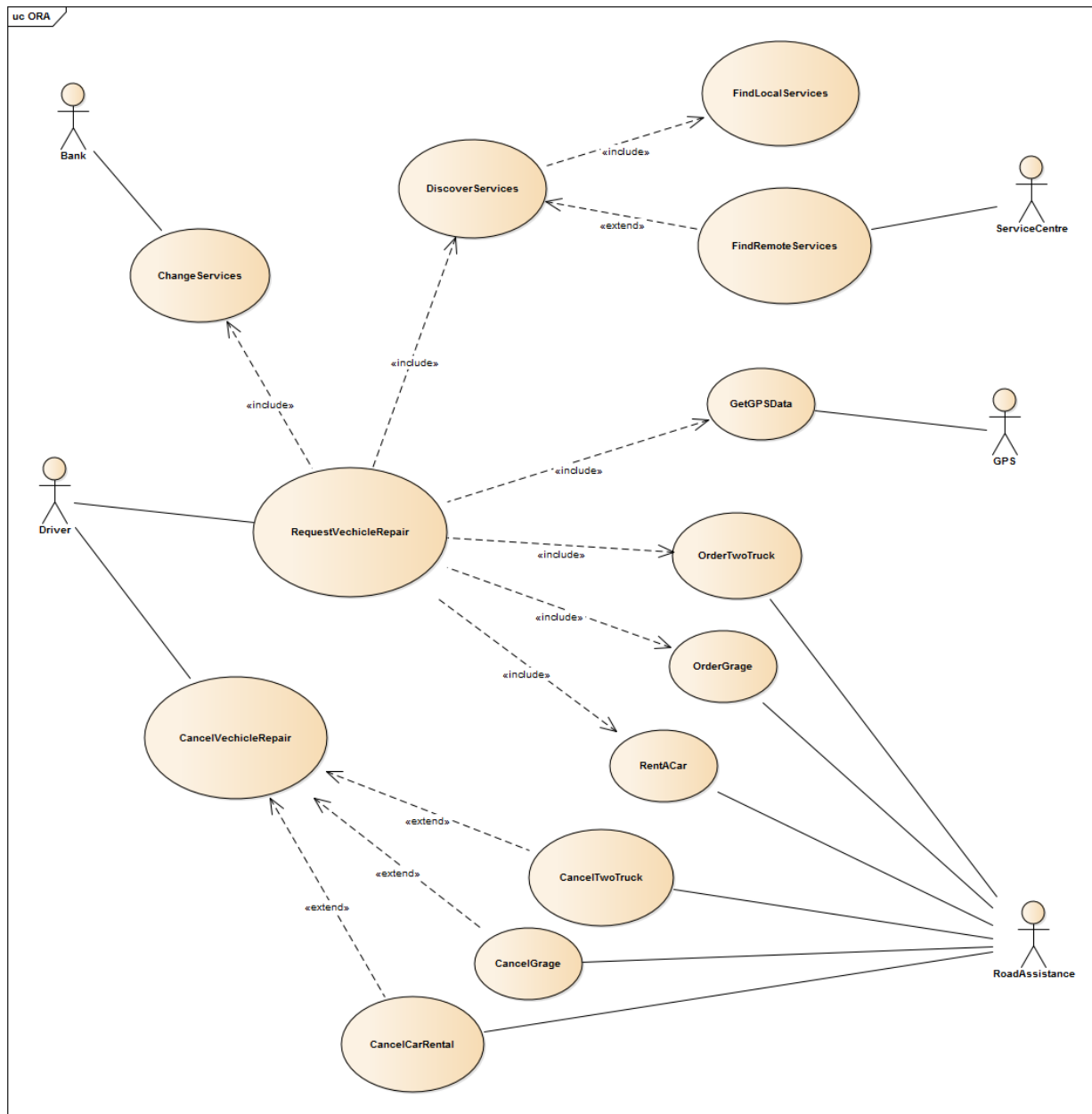


Figure 13 ORA Base Version

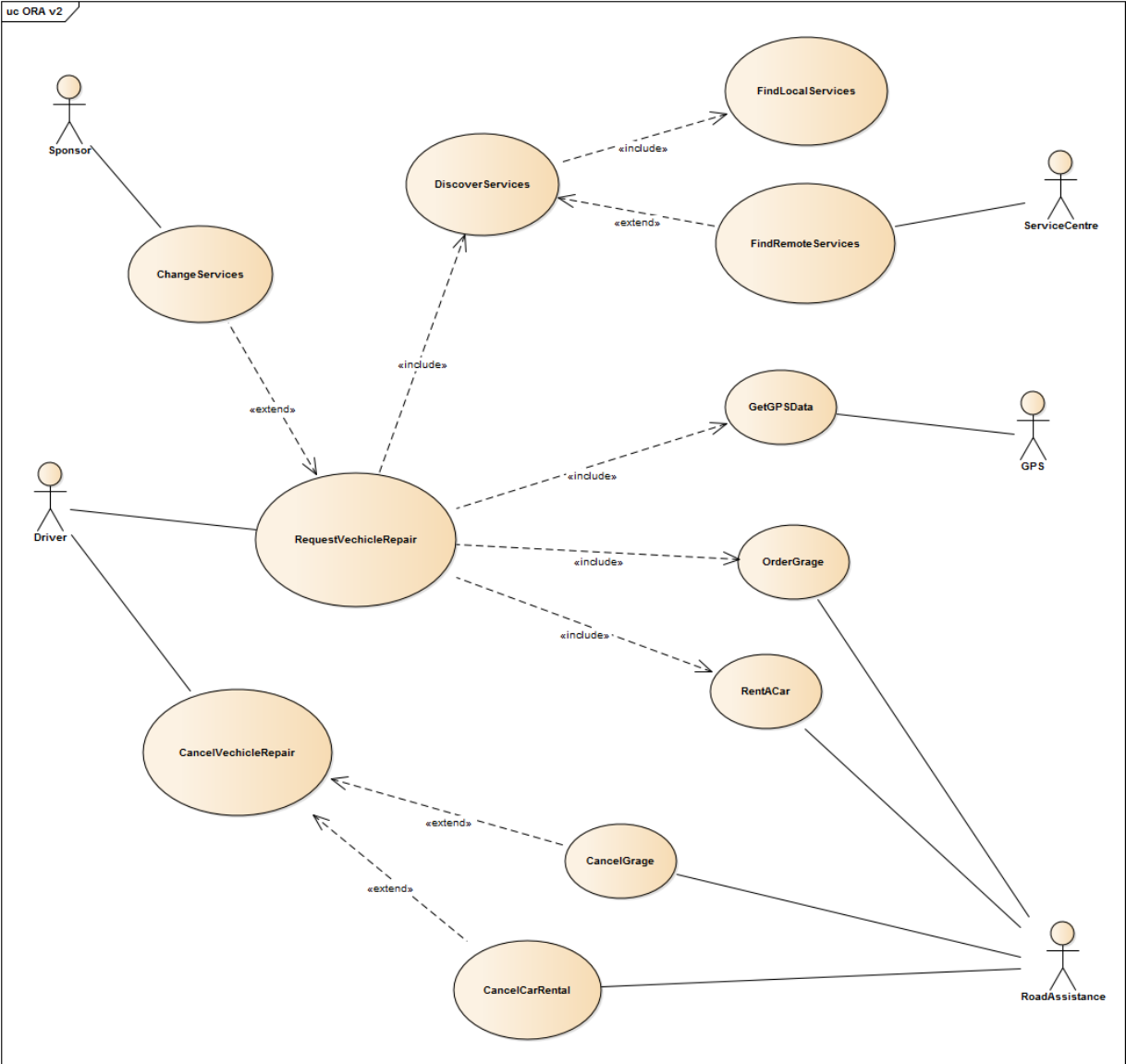


Figure 14 ORA version 1

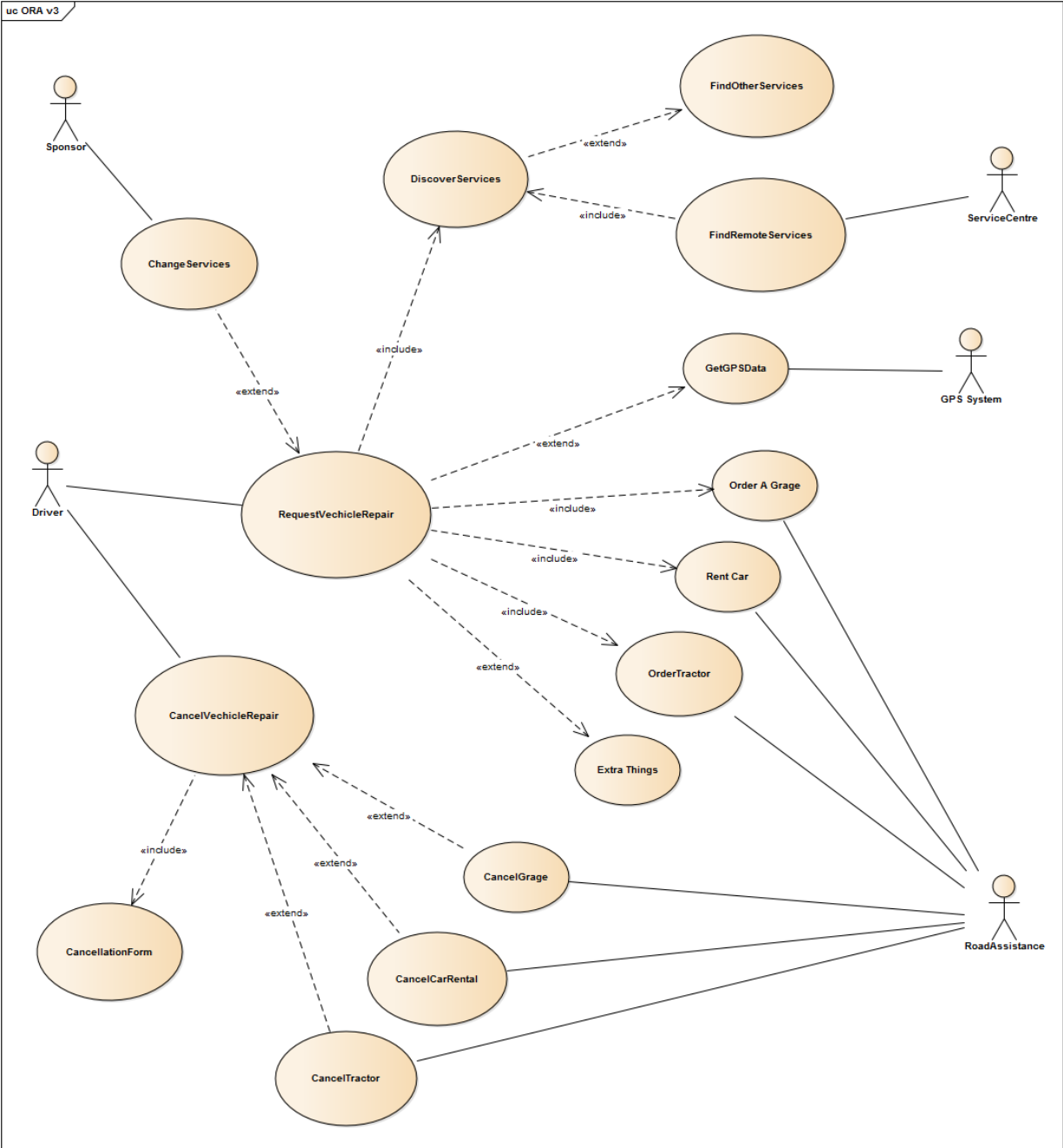


Figure 15 ORA version 2

Table 9 Changes from base version to version 1 & from base version to version 2

Identifier Name	Version 1		Version 2	
	Identifier Type	Identifier Relationships	Identifier Type	Identifier Relationships
Bank	DELETED - Change the name to Sponsor			
ChangeServices	Use Case	Bank-ASO	Use Case	-
		-		RequestVechicleRepair-EX
		-		Sponsor-ASO
DiscoverServices	Use Case with Extension Point	FindLocalServies-INC	Use Case with Extension Point	FindLocalServies-INC
FindLocalServies	Use Case	-	Use Case	-
FindRemoteServices	Use Case	ServiceCentre-ASO	Use Case	ServiceCentre-ASO
		DiscoverServices-EX		DiscoverServices-EX
ServiceCentre	Actor	FindRemoteServices-ASO	Actor	FindRemoteServices-ASO
Driver	Actor	RequestVechicleRepair-ASO	Actor	RequestVechicleRepair-ASO
		CancelVechicleRepair-ASO		CancelVechicleRepair-ASO
RequestVechicleRepair	Use Case	ChangeServices-INC	Use Case with Extension Point	-
		DiscoverServices-INC		DiscoverServices-INC
		GetGPSData-INC		-
		OrderTwoTruck-INC		OrderTwoTruck-INC
		OrderGrage-INC		OrderGrage-INC
		RentACar-INC		RentACar-INC
CancelVechicleRepair	Use Case with Extension Point	Driver-ASO	Use Case with Extension Point	Driver-ASO
		-		CancellationForm-INC
GetGPSData	Use Case	GPS-ASO	Use Case	GPS-ASO
GPS	Actor	GetGPSData-ASO	Actor	GetGPSData-ASO
OrderTwoTruck	DELETED - Change the name to OderTractor			
OrderGrage	Use Case	RoadAssistance-ASO	Use Case	RoadAssistance-ASO
RentACar	Use Case	RoadAssistance-ASO	Use Case	RoadAssistance-ASO
CancelTwoTruck	Use Case	RoadAssistance-ASO	Use Case	RoadAssistance-ASO
		CancelVechicleRepair-EX		CancelVechicleRepair-EX
CancelGrage	Use Case	RoadAssistance-ASO	Use Case	RoadAssistance-ASO
		CancelVechicleRepair-EX		CancelVechicleRepair-EX

CancelCarRental	Use Case	RoadAssistance-ASO	Use Case	RoadAssistance-ASO
		CancelVechicleRepair-EX		CancelVechicleRepair-EX
RoadAssistance	Actor	OrderTwoTruck-ASO	Actor	OrderTwoTruck-ASO
		OrderGrage-ASO		OrderGrage-ASO
		RentACar-ASO		RentACar-ASO
		CancelTwoTruck-ASO		CancelTwoTruck-ASO
		CancelGrage-ASO		CancelGrage-ASO
		CancelCarRental-ASO		CancelCarRental-ASO

Table 10 Stability Calculations

Classifier Name	No. of v1 changed Propertie s	No. of v2 changed Propertie s	No. of v1 Unique Propertie s	No. of v2 Unique Propertie s	v1 changed Average	v2 changed Average	
Bank	FULL	FULL	-	-	1	1	
ChangeServices	3	3	4	4	0.75	0.75	
DiscoverServices	0	2	2	2	0	1	
FindLocalServies	0	0		-	0	0	
FindRemoteServices	0	2	3	3	0	0.666666667	
ServiceCentre	0	0		-	0	0	
Driver	0	0		-	0	0	
RequestVechicleRepa ir	2	7	7	7	0.285714286	1	
CancelVechicleRepai r	0	1	3	3	0	0.333333333	
GetGPSData	0	3	3	3	0	1	
GPS	0	FULL		-	0	1	
OrderTwoTruck	FULL	FULL		-	1	1	
OrderGrage	0	0		-	0	0	
RentACar	0	0		-	0	0	
CancelTwoTruck	FULL	FULL		-	1	1	
CancelGrage	0	0		-	0	0	
CancelCarRental	0	0		-	0	0	
					SUM	4.035714286	8.75
					Instability	0.237394958	0.514705882
					Stability	0.762605042	0.485294118

UML Sequence Diagrams

1. ATM-Deposit

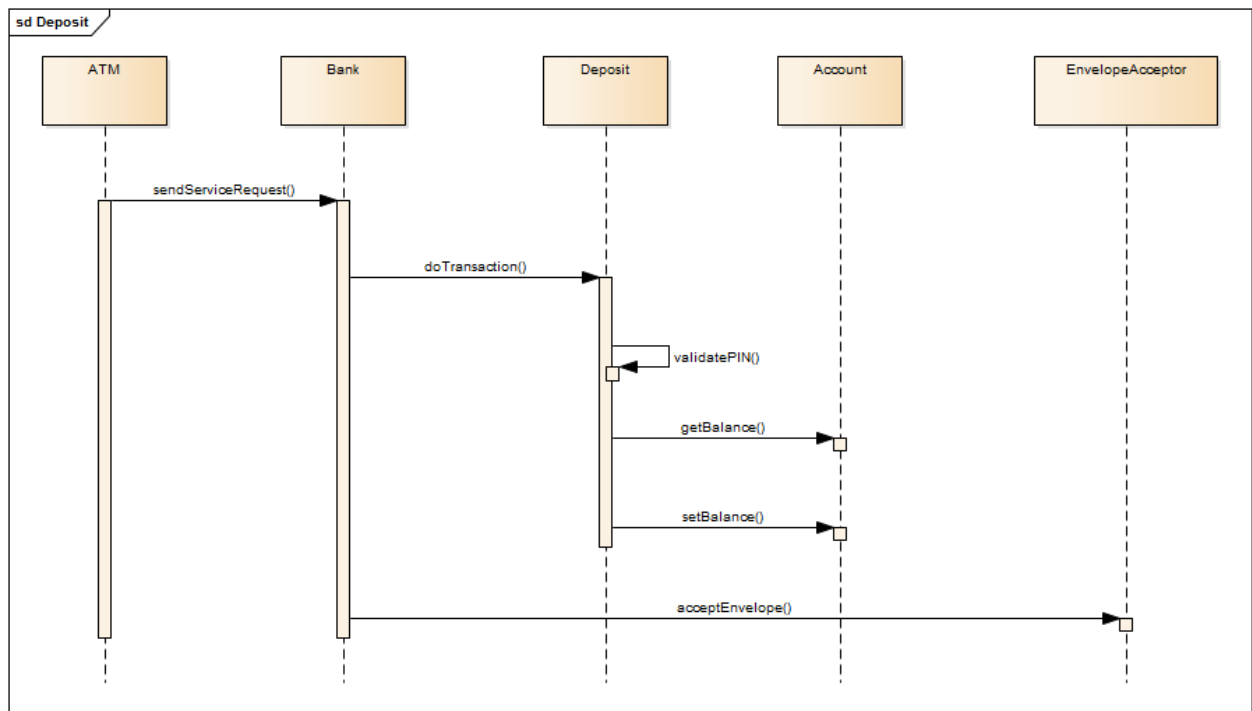


Figure 16 ATM-Deposit Base Version

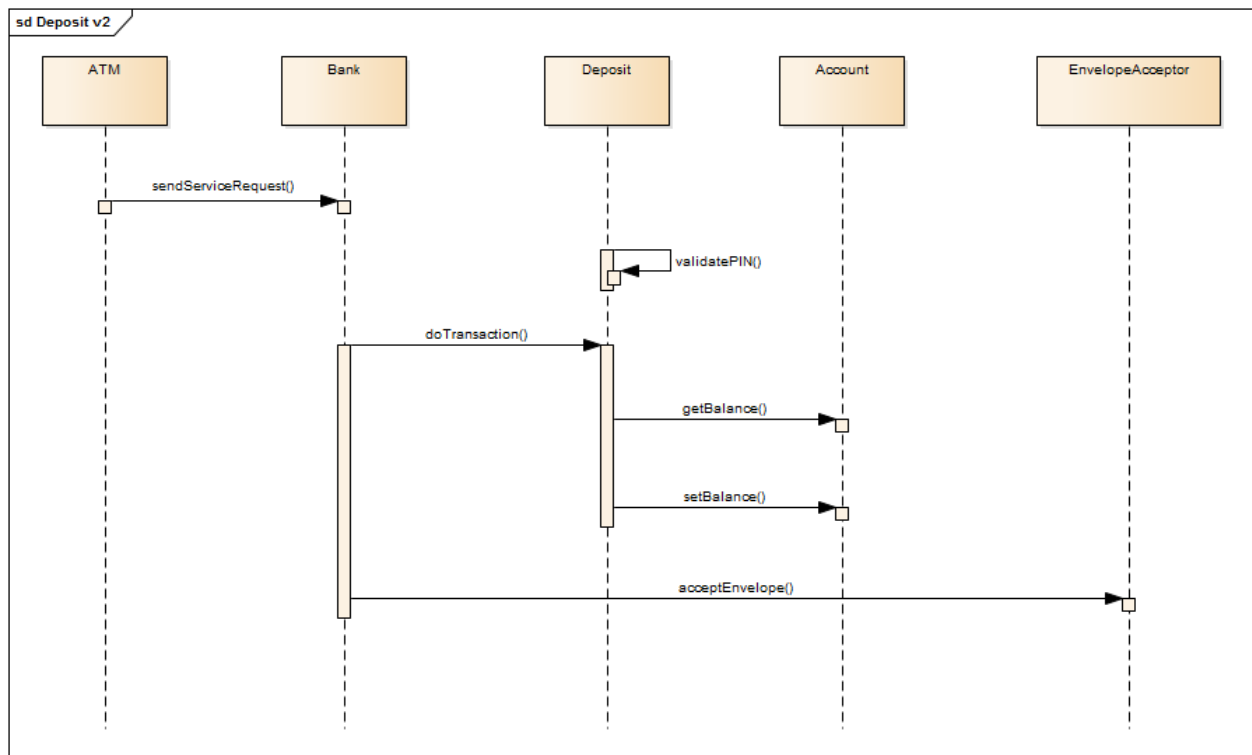


Figure 17 ATM-Deposit version 1

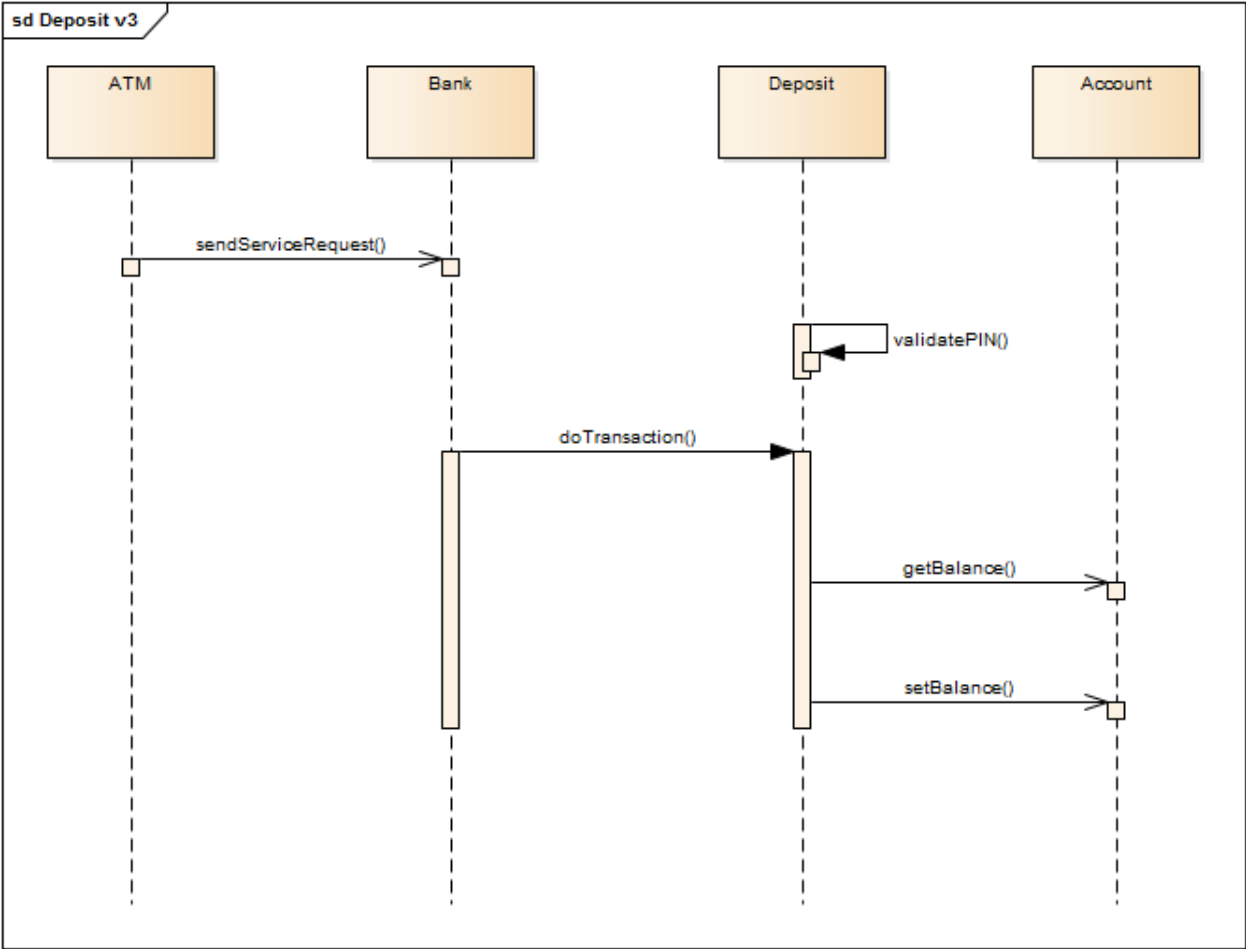


Figure 18 ATM-Deposit version2

Table 11 All Message Properties

Identifier		Properites								
Message Name	Message Receiver	Message Caller			Message Type			Message Order		
		Base	v1	v2	Base	v1	v2	Base	v1	v2
sendServiceRequest	Bank	ATM	ATM	ATM	Synchrono us	Synchron ous	Asynchr onous	1	1	1
doTransacti on	Deposit	Bank	Bank	Bank	Synchrono us	Synchron ous	Synchron ous	2	3	3
validatePIN	Deposit	Deposit	Deposit	Deposit	Synchrono us	Synchron ous	Synchron ous	3	2	2
getBalance	Account	Deposit	Deposit	Deposit	Synchrono us	Synchron ous	Asynchr onous	4	4	4
setBalance	Account	Deposit	Deposit	Deposit	Synchrono us	Synchron ous	Asynchr onous	5	5	5
acceptEnvel ope	Envelope Acceptor	Bank	Bank	-	Synchrono us	Synchron ous	-	6	6	-

Table 12 Stability Calculations

Identifier	No. of v1 changed Properties	No. of v2 changed Properties	Changed Average	Changed Average
sendServiceRequest	0	1	0	0.333333333
doTransaction	1	1	0.333333333	0.333333333
validatePIN	1	1	0.333333333	0.333333333
getBalance	0	1	0	0.333333333
setBalance	0	1	0	0.333333333
acceptEnvelope	0	3	0	1
Sum			0.666666667	2.666666667
Instability			0.111111111	0.444444444
Stability			0.888888889	0.555555556

2. ATM-Withdraw

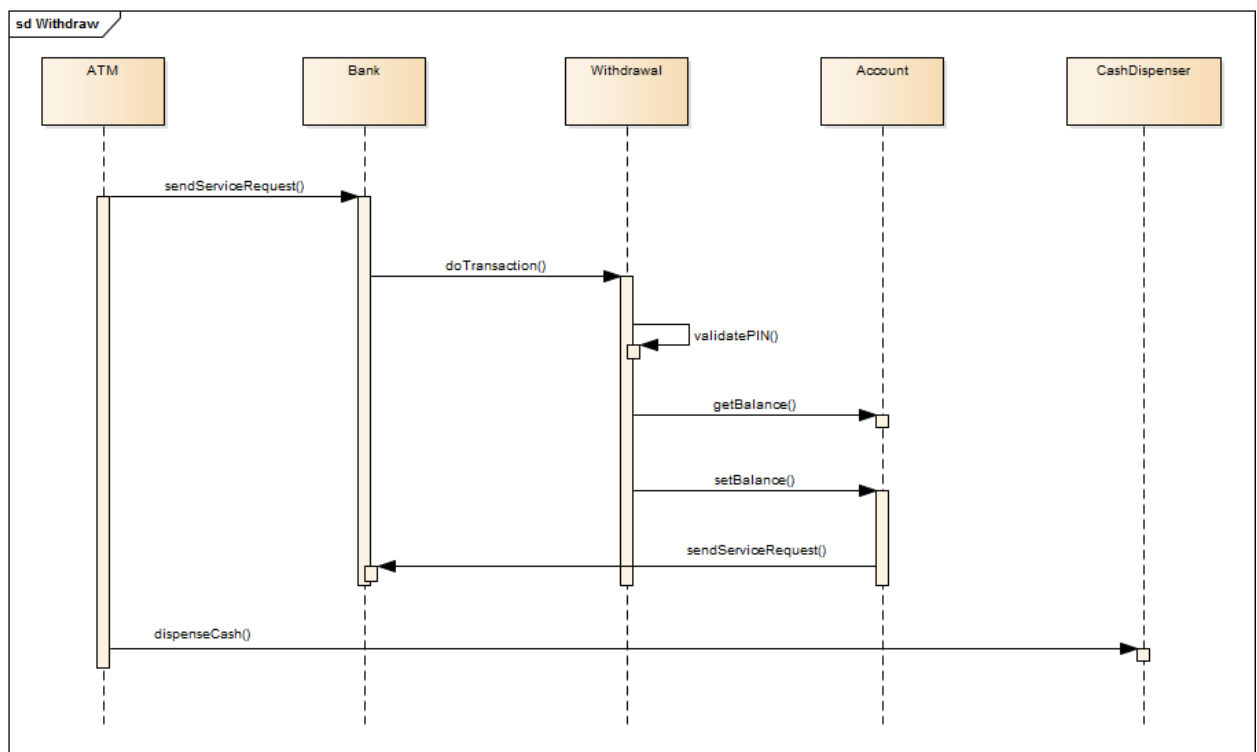


Figure 19 ATM-Withdraw Base Version

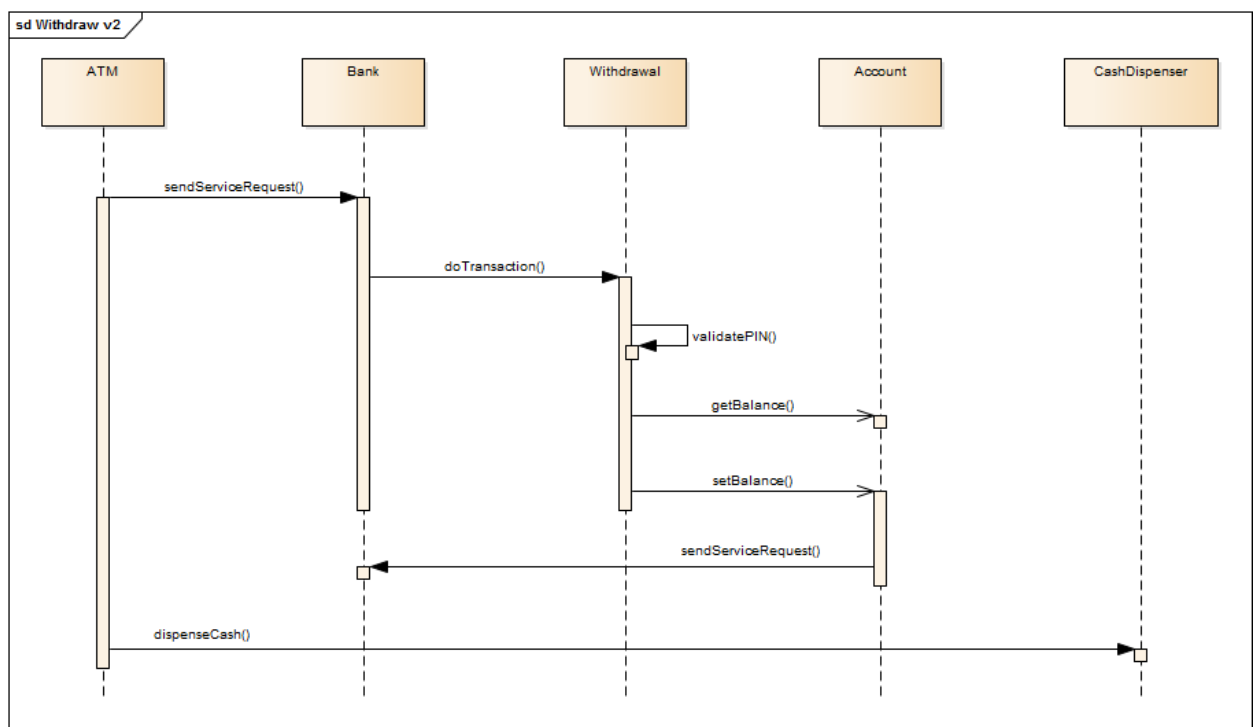


Figure 20 ATM-Withdraw Version 1

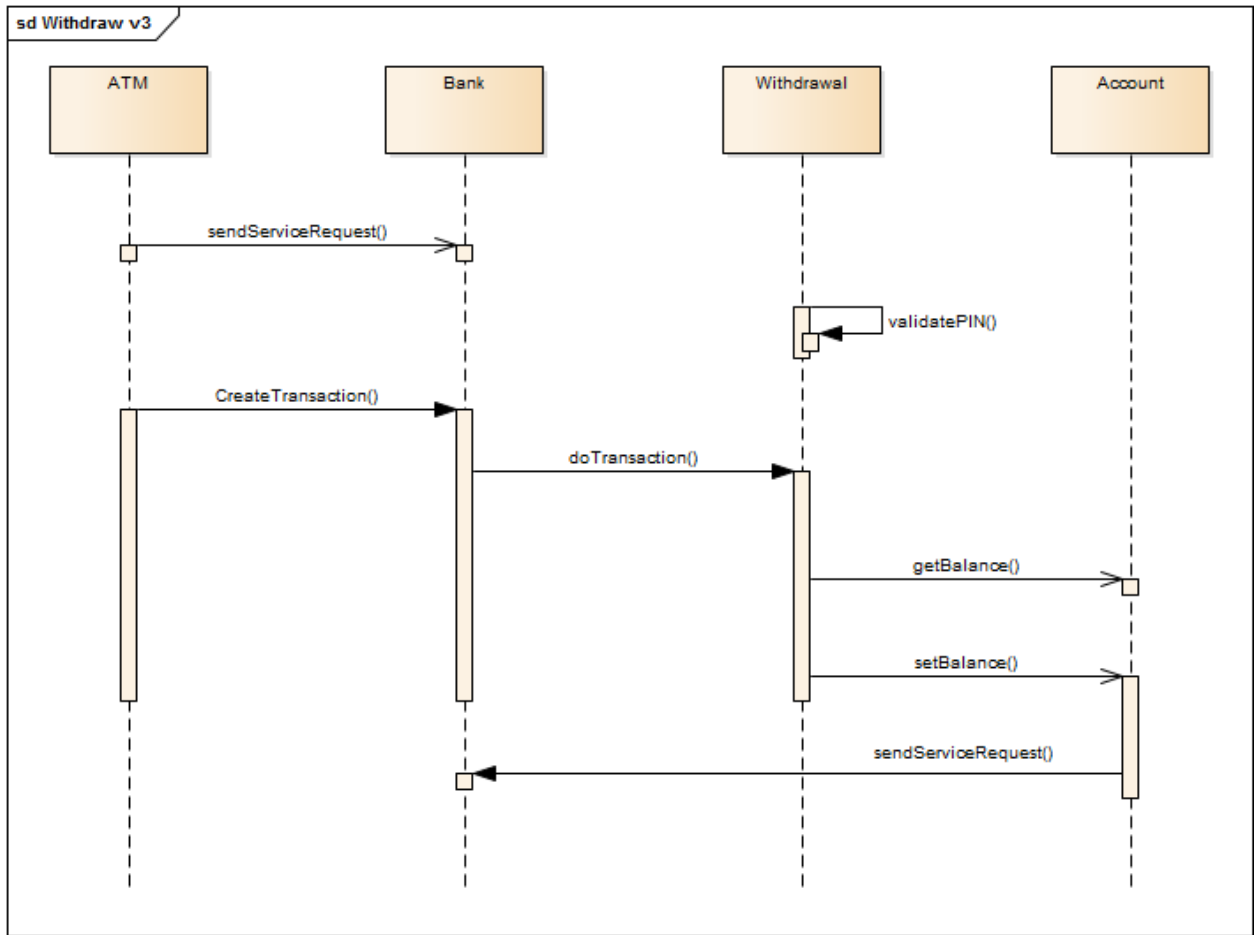


Figure 21 ATM-Withdraw Version 2

Table 13 All Message Properties

Identifier		Properites								
Message Name	Message Receiver	Message Caller			Message Type			Message Order		
		Base	v1	v2	Base	v1	v2	Base	v1	v2
sendServiceRequest	Bank	ATM	ATM	ATM	Synchronous	Synchronous	Asynchronous	1	1	1
doTransaction	Withdrawal	Bank	Bank	Bank	Synchronous	Synchronous	Synchronous	2	2	4
validatePIN	Withdrawal	Withdrawal	Withdrawal	Withdrawal	Synchronous	Synchronous	Synchronous	3	3	2
getBalance	Account	Withdrawal	Withdrawal	Withdrawal	Synchronous	Asynchronous	Asynchronous	4	4	5
setBalance	Account	Withdrawal	Withdrawal	Withdrawal	Synchronous	Asynchronous	Asynchronous	5	5	6
sendServiceRequest	Bank	Account	Account	Account	Synchronous	Synchronous	Synchronous	6	6	7
dispenseCash	CashDispenser	ATM	ATM		Synchronous	Synchronous		7	7	

Table 14 Stability Calculations

Identifier	No. of v1 changed Properties	No. of v2 changed Properties	Changed Average	Changed Average
sendServiceRequest	0	1	0	0.333333333
doTransaction	0	1	0	0.333333333
validatePIN	0	1	0	0.333333333
getBalance	1	2	0.333333333	0.666666667
setBalance	1	2	0.333333333	0.666666667
sendServiceRequest	0	1	0	0.333333333
dispenseCash	0	3	0	1
		Sum	0.666666667	3.666666667
		Instability	0.111111111	0.611111111
		Stability	0.888888889	0.388888889

Section 2

Learnability ratings from 1 - 10

Table 15 UML Class Diagrams Ratings

	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Subject 7	Subject 8	Subject 9
ATM v1	9	2	3	3	2	2	7	6	9
ATM v2	6	5	6	2	2	1	5	6	2
SCM v1	7	3	4	3	3	3	8	3	7
SCM v2	4	2	5	2	1	1	3	3	3
O-RED v1	6	2	4	3	1	4	6	4	8
O-RED v2	3	3	5	2	2	2	4	3	2

Table 16 UML Use Case Diagrams Ratings

	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Subject 7	Subject 8	Subject 9
HOSS v1	7	2	4	2	1	2	8	5	8
HOSS v2	4	3	5	1	1	2	4	4	3
ORA v1	8	4	6	3	2	2	6	5	9
ORA v2	5	2	8	2	2	3	8	6	1

Table 17 UML Sequence Diagrams Rating

	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Subject 7	Subject 8	Subject 9
Deposit v1	7	2	4	2	1	3	6	2	7
Deposit v2	3	2	5	1	1	1	5	2	2
Withdraw v1	6	2	6	1	1	1	7	2	9
Withdraw v2	5	4	5	2	1	3	6	2	1

Analyzability ratings from 1 - 10

Table 18 UML Class Diagrams Ratings

	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Subject 7	Subject 8	Subject 9
ATM v1	10	6	7	2	3	3	8	6	7
ATM v2	6	5	6	3	2	2	5	5	3
SCM v1	9	4	3	3	3	2	9	2	8
SCM v2	5	3	5	2	2	4	3	2	2
O-RED v1	7	3	5	2	2	2	6	4	9
O-RED v2	4	5	4	2	3	4	3	4	1

Table 19 UML Use Case Diagrams Ratings

	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Subject 7	Subject 8	Subject 9
HOSS v1	7	6	7	2	2	4	9	4	6
HOSS v2	4	5	4	2	2	2	5	3	2
ORA v1	10	5	4	2	2	5	7	4	8
ORA v2	6	3	5	2	2	3	8	5	2

Table 20 UML Sequence Diagrams Rating

	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Subject 7	Subject 8	Subject 9
Deposit v1	8	5	8	2	1	3	6	2	7
Deposit v2	5	3	5	2	1	4	5	2	1
Withdraw v1	6	3	5	1	1	2	7	3	9
Withdraw v2	6	5	7	1	1	4	6	3	1

Modifiability ratings from 1 - 10

Table 21 UML Class Diagrams Ratings

	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Subject 7	Subject 8	Subject 9
ATM v1	9	8	7	3	3	4	7	7	7
ATM v2	7	4	5	1	4	5	5	6	3
SCM v1	8	6	7	3	5	5	8	3	7
SCM v2	5	4	6	1	2	3	4	3	2
O-RED v1	8	6	7	3	2	5	7	5	6
O-RED v2	4	2	5	1	5	3	5	4	3

Table 22 UML Use Case Diagrams Ratings

	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Subject 7	Subject 8	Subject 9
HOSS v1	6	7	6	3	3	4	8	4	7
HOSS v2	5	4	6	1	2	5	5	3	3
ORA v1	9	4	5	1	3	2	6	5	9
ORA v2	6	6	4	1	2	5	8	6	1

Table 23 UML Sequence Diagrams Rating

	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Subject 7	Subject 8	Subject 9
Deposit v1	7	5	7	1	5	2	7	3	7
Deposit v2	4	3	4	1	3	4	5	2	2
Withdraw v1	7	6	6	2	5	3	8	3	8
Withdraw v2	5	4	2	1	3	5	7	4	2