CHAPTER 5

TESTING AND IMPLEMENTATION

5.1 System Specification

The entire process of thesis writing, program writing, as well as testing is done in author's notebook computer. During that entire process, there are a number of hardware and software specifications involved. This section will discuss about hardware and software requirements to run SMS gateway application.

5.1.1 Hardware

- Acer Aspire 5594WXMi
- Inter Core 2 Duo Processor T5600
- 120G HDD
- 1GB DDR2 RAM
- Nokia 3100
- Nokia Connectivity Adapter Cable CA-42

5.1.2 Software

- Microsoft Windows XP
- Gammu Open Source
- Nokia Connectivity Cable Driver
- MySQL 5.0
- Apache Web Server
- Edit Plus 2
- PHPMyAdmin
- CodeIgniter Framework
- Web Browser: Mozilla Firefox 3.0
- Microsoft Office 2007

5.2 Operational Procedures

To be able to build and run the application properly, theer are necessary operational procedure that needs to be completed:

- First, we download and install all the programs: MySQL, apache web server, and nokia connectivity cable driver.
- 2. Then, we dumb the SMS database to MySQL database.
- Copy folder TrafficSolutionSMS and smsservice to the apache folder in htdocs folder.
- 4. After that, make sure you set the main website (the author's partner thesis project) destination of all files in smsservice/webservice folder. This step will determine the connection / web service of SMS gateway application. Example:

```
function AutomaticReq() {
    $this->client = new soapclient("http://localhost/clientRequest/automaticResponse.php");
    $err = $this->client->getError();
    if ($err) {
        echo '<b>Error: '. $err . '</b>';
    }
}
```

Figure 5.1 Web Service Setting

- 5. Copy folder gammu to C: $\$
- 6. After everything is set, we can plug in nokia cable driver CA-42 and make sure the mobile phone is connected to the computer.
- Open command prompt and type "cd c:\gammu\win32". After that, we type "gammu --identify". If the respond is like below, then the connection between mobile phone and gammu has been established.

C:\WINDOWS\system32\cmd.exe

٠ C:\gammu\win32>gammu --identify [Gammu - 1.09.00 built 22:03:05 Dec 6 2006 in MS VC .NET 2005] [Connection - "fbusp12303"] [Model type - ""] [Connection [Model type [Device "com6:"] Win XP Pro SP2] TRun on "II" Device is \\.\COM6 Serial device: DTR is down, RTS is down Serial device: DTR is up, RTS is up Device is \\.\COM6 Serial device: DTR is down, RTS is down Serial device: DTR is down, RTS is down [Run on

Figure 5.2 Gammu – identify

The next step we type "gammu –smsd MYSQL smsdrc". If the respond is like below, then gammu is working.

- 🗆 🗙

C:\gammu\win32>gammu --smsd MYSQL smsdrc Log filename is "smsdlog" Press Ctrl+C to stop the program ... IGammu - 1.09.00 built 22:03:05 Dec 6 2006 in MS VC .NET 2005] IConnection - "fbuspl2303"] IModel type - ""] IDevice - "com6:"] IRun on - Win XP Pro SP2] Device is \.\COM6 Serial device: DTR is down, RTS is down Serial device: DTR is up, RTS is up Device is \.\COM6 Serial device: DTR is down, RTS is down IModule - "auto"] Getting model SENDING frame type 0xD1/length 0x05/5 00 101 100 103 100 IReceived Ack of type d1, seq 80] ISending Ack of type d2, seq 5] RECEIVED frame type 0xD2/length 0x38/56 01 100 103 150!120 13001355!2E.13551344!20 120 120 120U 05.54 0A 13111366!2D-1300!377!2D-1300!344!0A 152R!48H!2D-13111399!0A ..16-07-04.RH-19. 28<(63c:129)120 14EN!6Fo!6Bk!69!6161a!2E.!20 120 120 120 120 (c) Nokia. 20 120 120 120 120 120 120 100

Figure 5.3 Gammu -smsd MYSQL smsdrc

8. Finally, we open smsservice folder, then click 'start.exe'.



Figure 5.4 Running Webservice

9. Then SMS control panel is set and ready to receive any incoming message.

5.3 System Implementation

The development of this application used the Rapid Application Development (RAD) strategy where prototypes of the system are built interactively. The first stage of the development is the planning stage where the author analyzes the existing problem with current Jakarta traffic condition.

In the next stage, which was analysis, system requirements were gathered, discussed and also structured. Afterwards, the physical design was determined. This is where the technology-specific details, such as programming language and the tools, are selected. It was decided that the language to be used for the construction of SMS gateway application is PHP, and the database used was MySQL since it is compatible with gammu open source SMS gateway.

5.4 Testing

The test plan phase is done to make sure that the application can run the actions according to the way they are supposed to be. The test should involve all possible input data and should return the correct error handling.

5.4.1 SMS Gateway Service

	SMS GATEWAY SERVICE							
No	Test Case	Test Steps	Output/Result	Status				
1	Register	1. User sends [reg] [ts] [full	The system will	OK /				
		name] to the SMS gateway	register user	Passed				
		mobile phone	and return	with no				
		2. The system will check	success	errors				
		whether the user already	message					
		registered in the system						
		before or not						
		3. If not, then the user will						
		get a success message, else						
		the user will get a						
		notification message that						
		he already become a						
		member						
	C:\WINDOWS\sy	stem32\cmd.exe		- 🗆 ×				
	[Monday 14th Dec Prefix = reg ts Content = alfrec Service Congratulations,	ember 2009 ¦ 10:31:41 PM] : l . now you are registered in	running service our database.	····				
		Figure 5.5 First Time Registe	r					
	C:\WINDOWS\sy	stem32\cmd.exe		- 🗆 ×				
	[Monday 14th Dec	cember 2009 10:33:01 PM]	running service					
	Prefix = reg ts Content = alfred Semuice	1						
	You already beco	ome a member						
		Figure 5.6 Second Time Regist	ter					
2	Unregister	1. User sends [unreg] [ts]	The system will	OK /				
		[reason] to the SMS	unregister user	Passed				
		gateway mobile phone	and return	with no				

		2.	User gets success message	success	errors						
				message							
	C:\WINDOWS\system32\cmd.exe										
	[Monday 14th December 2009 10:36:23 PM] running service Prefix = unreg ts Content = not living in Jakarta anymore Service You are now unregistered. Thank you for your partisipation.										
			Figure 5.7 Unregister								
3	View services	1.	User sends [view]	The system will	OK /						
			[services] to the SMS	get all services	Passed						
			gateway mobile phone	from the	with no						
		2.	User gets a reply message	database and	errors						
			containing the available	send it to the							
			services	user							
	C:\WINDOWS\sy	sten	132\cmd.exe		- 🗆 🗙						
	[Monday 14th Dec Prefix = view so Content = [reg] [ts] [ful] [unreg] [ts] [re [view] [services [info] [ts] [str [view] [street] [ts] [street_po	cem] erv: 1 na easo s] reet int:	ber 2009 ¦ 10:39:28 PM] ices ame] bn] ;]] [crowded/light]	running service	· · · · ·						
			Figure 5.8 View Services								
4	View traffic	1.	Users sends [info] [ts]	The system will	OK /						
	condition		[street] to the SMS	get the street	Passed						
			gateway mobile phone	condition from	with no						
		2.	The system will check	the main	errors						
			whether the street is	website and							
			available in the database	then send it to							
			or not	the user							
		3.	If it is, then the user will								
1		1	get a replay message								

			containing the street							
			condition, else the user							
			will get an error message							
	C:\WINDOWS\system32\cmd.exe									
	[Monday 14th December 2009 10:41:54 PM] running service.									
	Prefix = info ts Content = sudirman Service sudirman: (HI area)-UNKNOWN-Last Update:2009-11-15 18:40:54 (semanggi)-UNKNOWN-Last Update:2009-11-15 18:42:12 (senayan)-UNKNOWN-Last Update:2009-11-15 18:40:14									
	Figure 5.9 View Traffic Condition (Available Street)									
	C:\WINDOWS\syste	em32	\cmd.exe							
	[Monday 14th Decem	nber	• 2009 10:44:19 PM] runnir	ng service						
	Prefix = info ts Content = diponogo Service	oro		Turne Hadamaata						
	available streets.	s no - -	it exist in our database yet	. Type "view stre	et" to see					
5	Figur	re 5.	Ligan and [view] [street]	The aveter will	OK /					
5	view available	1.								
	street		to the SMS gateway	get all available	Passed					
			mobile phone	street from the	with no					
		2.	User gets a replay message	main website	errors					
			containing the street	and then send it						
			condition	to the user						
	C:\WINDOWS\sys	sterr	n32\cmd.exe							
	[Monday 14th Dec	ent:	per 2009 11:05:39 PM] :	running service						
	Prefix = view st Content = sudirman thamrin	ree ga	et atsu							
			Figure 5.11 View Available Str	reet						
6	Send traffic info	1.	Users sends [ts]	The system will	OK /					
	1	1	F / / · · · · · · · · · · · · · · · · ·	1 1 1 1 1	D 1					
			[street_point]	check the street	Passed					
			[street_point] [crowded/light] to the	and update the	Passed with no					

	C:\WINDOWS\s IMonday 14th De Prefix = ts sud Content = light	2. yste cen	phone User gets success message m32\cmd.exe hber 2009 11:09:43 PMJ han1	database and return success message running servic	e
	Service Street Informat Thank you for y	ion Jour	information.		
			Figure 5.12 Send Traffic Info	0	
7	SMS service fuzzy	1.	Every 12 o'clock at	The system will	OK /
	logic		midnight, the system will	register users	Passed
			perform a system checking	phone number	with no
			for users that has been	along with the	errors
			registered for a month	street, time, and	
			automatically	day for the	
		2.	Then the system will	automatic SMS	
			check users behavior in		
			sending SMS of that		
			month		
		3.	Base on several		
			calculation, the system		
			will decide whether the		
			users need automatic SMS		
			or not		
		4.	If yes, then the system will		
			register users phone		
			number along with the		
			street, time, and day for		
			the automatic SMS		

C:\WINDOWS\syste	em32\cmd.exe	
[Wednesday 13th J	anuary 2010 ¦ 12:00:04 AM] running service	
######################################	######################################	
Phone : +62856118	5700	
Street: sudirman		
Monday:		
Tuesday:		
Wednesday: 9(hour) = 3		
Automatic sms to y has been regist	+628561185700 about sudirman street at 9:00 o'c er	lock on We
Thursday:		
Friday:		
Saturday:		
Sunday:		
Street: thamrin		
monday:		
Tuesday:		
Wednesday:		
Thursday:		
Friday:		
Saturday:		
	Figure 5.13 Fuzzy Logic Checking	
Automatic SMS	1. Every minute, the system The system will	OK /
	will check whether there is send the	Passed
	an automatic SMS that message to the	with no
	need to be send or not destination	errors
	2. If there is then the system number	

			will send the message to						
			the destination number						
	C:\WINDOWS\system32\cmd.exe								
	[Monday 11th January 2010 09:00:05 PM] running service								
	**** SENDING TRAFFIC INFORMATION:								
	To: +62856118570 Message: sudirma (HI anga)-IICHT-	0 n: Las	t Undate:2009-12-14 22:0	ag - 43					
	(semanggi)-UNKNO (senayan)-UNKNOW	WN- N-L	Last Update:2009-11-15 1 ast Update:2009-11-15 1	18:42:12 8:40:14					
			Figure 5.14 Automatic SMS						
9	User enters wrong	1.	User enters any syntax	The system will	OK /				
	syntax		there are not predefined in	parse the	Passed				
			the system	message and try	with no				
		2.	The user will get syntax	to match it with	errors				
			error message	the predefined					
				syntax in the					
				database. If it					
				matches, do the					
				required					
				operation, else					
				send an error					
				message					
	C:\WINDOWS\sys	stem	32\cmd.exe						
	[Monday 11th Jan	uar	y 2010 ¦ 09:01:32 PM] r	unning service.					
	Prefix = reg aa Content = alfred	l							
	Syntax error You provided a w	ron	g command. Please refer	to the manual.	Thank yo				
			Figure 5.15 Wrong syntax						

Table 5.1 SMS Gateway Service Testing

5.4.2 SMS Gateway Control Panel

SMS GATEWAY CONTROL PANEL							
No.	Test Case		Test Steps	Output/Result	Status		
1	Login with	1.	User fills in	User is logged in	OK /		
	valid username		username and	and redirected to	Passed		
	and password		password fields	the user's home	with no		
		2.	Submit login form	page	errors		
2	Login with	1.	User fills in	System returns	OK /		
	invalid		username and	incorrect login	Passed		
	username and		password fields	confirmation	with no		
	password	2.	Submit login form		errors		
3	Logout	1.	User selects	User is logged out	OK /		
			logout option	from the system	Passed		
				and redirected to	with no		
				the home page	errors		
	S olution						
Vel You ar	S Elution come SMS Gateway f	or Tr	▶ Ho	ome	▶ SMS → Change		
► Wel	S Elution	or Tr	► Ho raffic Jam Copyright © 2009 by /	ame	SMS → Change I		
You an	S Elution come SMS Gateway f re logged in. Logout here Figu	or Tr	۲ Ho raffic Jam Copyright © 2009 by . 16 Web Application - L	ome	SMS → Change		
You and	S Elution come SMS Gateway f re logged in. Logout here Figu View group	for Tr re 5.	• Ho raffic Jam Copyright © 2009 by J 16 Web Application - L User selects view	Alfred Widjaya.	→ SMS → Change		
You and	S Elution come SMS Gateway f re logged in. Logout here Figu View group	ior Tr re 5.	۲ Ho raffic Jam Copyright © 2009 by . 16 Web Application - L User selects view group option in	Alfred Widjays.	SMS → Change OK / Passed		
You and	S Elution come SMS Gateway f re logged in. Logout here Figu View group	or Tr re 5.	raffic Jam Copyright © 2009 by J 16 Web Application - L User selects view group option in phonebook menu	Alfred Wildjays.	> SMS > Change OK / Passed with no		
You and A	S Elution come SMS Gateway f re logged in. Logout here Figu View group	for Tr re 5.	raffic Jam Copyright © 2009 by J 16 Web Application - L User selects view group option in phonebook menu	Alfred Wildjays.	> SMS > Change OK / Passed with no errors		
You and the second s	Come SMS Gateway f re logged in. Logout here Figu View group	for Tr re 5. 1.	raffic Jam Copyright © 2009 by J Copyright ©	Alfred Widjays. Ogin/Logout The system gets data from database and show it to the user The system will	> SMS > Change OK / Passed with no errors OK /		
You and the second s	Come SMS Gateway f re logged in. Logout here Figu View group	for Tr re 5. 1.	raffic Jam Copyright © 2009 by J Copyright ©	Alfred Widjays. Ogin/Logout The system gets data from database and show it to the user The system will update data from	> SMS > Change OK / Passed with no errors OK / Passed		
You and the second s	Come SMS Gateway f re logged in. Logout here Figu View group Update group	for Tr re 5. 1. 1.	affic Jam Copyright © 2009 by J Copyright ©	Alfred Wildjays. Ogin/Logout The system gets data from database and show it to the user The system will update data from database	> SMS > Change OK / Passed with no errors OK / Passed with no		
You and the second s	Come SMS Gateway f re logged in. Logout here Figu View group Update group	re 5. 1. 1. 2.	affic Jam Copyright © 2009 by J Copyright ©	Alfred Widjays. Ogin/Logout The system gets data from database and show it to the user The system will update data from database	> SMS → Change OK / Passed with no errors OK / Passed with no errors		

6	Delete group	1.	User selects delete	The system will	OK /
			link	remove data from	Passed
		2.	Confirm delete	database	with no
					errors
7	Clear group	1.	User selects clear	All data will be	OK /
			option	removed from the	Passed
				database	with no
					errors
8	Add group	1.	User selects add	The new group	OK /
			group	will be added to	Passed
		2.	Input group name	the database	with no
		3.	Submit form		errors
9	View	1.	Users select view	The system will	OK /
	phonebook		phonebook	get the data from	Passed
				database and show	with no
				it	errors
10	Update	1.	User selects	it The system will	errors OK /
10	Update phonebook	1.	User selects update link	it The system will update database	errors OK / Passed
10	Update phonebook	1. 2.	User selects update link User makes	it The system will update database	errors OK / Passed with no
10	Update phonebook	1.	User selects update link User makes require changes	it The system will update database	errors OK / Passed with no errors
10	Update phonebook	1. 2. 3.	User selects update link User makes require changes Submit form	it The system will update database	errors OK / Passed with no errors
10	Update phonebook Delete	1. 2. 3. 1.	User selects update link User makes require changes Submit form User selects delete	it The system will update database The data will be	errors OK / Passed with no errors OK /
10	Update phonebook Delete phonebook	1. 2. 3. 1.	User selects update link User makes require changes Submit form User selects delete link	it The system will update database The data will be deleted from the	errors OK / Passed with no errors OK / Passed
10	Update phonebook Delete phonebook	1. 2. 3. 1. 2.	User selects update link User makes require changes Submit form User selects delete link Confirm delete	it The system will update database The data will be deleted from the system	errors OK / Passed with no errors OK / Passed with no
10	Update phonebook Delete phonebook	1. 2. 3. 1. 2.	User selects update link User makes require changes Submit form User selects delete link Confirm delete	it The system will update database The data will be deleted from the system	errors OK / Passed with no errors OK / Passed with no errors
10 11 12	Update phonebook Delete phonebook	1. 2. 3. 1. 2. 1. 2. 1. 1. 1. 1. 1. 1. 1. 1.	User selects update link User makes require changes Submit form User selects delete link Confirm delete	it The system will update database The data will be deleted from the system The system will	errors OK / Passed with no errors OK / Passed with no errors OK /
10 11 12	Update phonebook Delete phonebook Add phonebook	1. 2. 3. 1. 2. 1. 2. 1. 1. 1. 1.	User selects update link User makes require changes Submit form User selects delete link Confirm delete User selects add new phonebook	it The system will update database The data will be deleted from the system The system will add new data to	errors OK / Passed with no errors OK / Passed with no errors OK / Passed
10 11 11	Update phonebook Delete phonebook Add phonebook	1. 2. 3. 1. 2. 1. 2. 1. 2. 1. 2. 1. 2. 1. 2. 1. 2. 1. 2.	User selects update link User makes require changes Submit form User selects delete link Confirm delete User selects add user selects add new phonebook	it The system will update database The data will be deleted from the system The system will add new data to database	errors OK / Passed with no errors OK / Passed with no errors OK / Passed with no
10 11 12	Update phonebook Delete phonebook Add phonebook	1. 2. 3. 1. 2. 1. 2. 1. 2. 1. 2. 1. 2. 1. 2.	User selects update link User makes require changes Submit form User selects delete link Confirm delete User selects add user selects add new phonebook Input data for new	it The system will update database The data will be deleted from the system The system will add new data to database	errors OK / Passed with no errors OK / Passed with no errors OK / Passed with no errors

	Troffic Selution		► Ho	me ▶Phonebook ▶	Service	► SMS → Change L
View	v Phonebook				Searc	:h
No 🔲	Name Phone Grou	ıp				Sea
1 🔳	alfred +628561185700 New	Memb	er <u>Send SMS</u> <u>Update</u> <u>Delete</u>	Į.	-	
<u>Clear p</u>	honebook Send to selected	List			Other	Links
					[Phonebo	ok Home]
					[View Gro	oup]
					[Add Grou	up]
					[Add Pho	nebook]
			Copyright © 2009 by A	Alfred Widjaya.		
	Fig	ure 5	5.17 Web Application -]	Phonebook		
13	Quicksend	1.	From phonebook,	The message	will	OK /
	message		user selects	be send to the	e	Passed
			quicksend	outbox to be		with no
			message option	proceed		errors
		2.	Write message			
		3.	Click send button			
14	Send to	1.	From phonebook,	The message	will	OK /
	selected list		user selects name	be send to the	e	Passed
			list	outbox to be		with no
		2.	Click send to	proceed		errors
			selected list			
		3.	Write message			
		4.	Click send button			
15	View message	1.	User selects view	Message is		OK /
	(inbox, outbox,		message option	displayed to	user	Passed
	and sent item)					with no
						errors

16	Delete message	1.	User selects delete	Particular message	OK /		
	(inbox, outbox,		message option	is deleted from the	Passed		
	and sent item)	2.	Confirm delete	database	with no		
					errors		
17	Clear message	1.	User selects clear	All particular	OK /		
	(inbox, outbox,		message option	message is deleted	Passed		
	and sent item)	2.	Confirm clear		with no		
			message		errors		
 Inbox Page: No Da 1 200 09: 2 200 09: Page: Clear in 	No DateTime Sender TextDecoded Processed 1 2009-10-20 +628561185700 ts senanyan light true delete [SMS Home] 2 2009-10-20 +628561185700 ts senanyan light true delete [SMS in inbox] 2 2009-10-20 +628561185700 ts sudirman crowded true delete [SMS in outbox] Page: [SMS in outbox] [SMS in outbox] Page: [Compose new SMS]						
			Copyright © 2009 by A	Alfred Widjaya.			
			5 19 Web Application	Magaaga			
18	Compose		User selects	The message will	OK /		
10	message	1.	compose message	he send to the	Dassed		
	message		ontion	outhoy to be	with no		
		r	Insert the phone	proceed	errors		
		∠.	destination and	proceed	011015		
			message				
		2	Click sand				
		5.	CHER SCHU				

	Troffic Selution	► Home	▶ Phonebook → Service → SMS → Change L
> Con	npose a new message		Other Links
Destir Mess Chars	age	<u>View phonebook</u>	[SMS Home] [SMS in inbox] [Sent SMS] [SMS in outbox] [Compose new SMS]
		Copyright © 2009 by Alfred V	idjaya.
	Figure	5.19 Web Application - Compos	e Message
19	View service	1. User select view Th	e services is OK /
		service option dis	played Passed
			with no
			errors
20	Delete service	1. User selects delete Th	e particular OK /
		option set	vice is deleted Passed
		2. Confirm delete	with no
			errors
21	Update service	1. User selects Th	e data will be OK /
		update option up	dated Passed
		2. User makes	with no
		require changes	errors
		3. Submit form	
22	Create service	1. User selects create Ac	ld new data to OK /
		service option the	e database Passed
		2. Input the form for	with no
		create new service	errors
		3. Submit the form	

_										
			S Blu	io tion			▶ Hom	e Phonebook	▶ Service	→ SMS → Change I
	V	iew	Service				-		Other	r Links
Г	No 1	servi	e Prefix ice reg ts	Usage [reg] [ts] [fi	ıll name]	Description register to traffic	<u>Updat</u>	te <u>Delete</u>	[Manage	Action]
	2	serv	ice unreg ts	[unreg] [ts]	[reason]	solution SMS unregistered from traffic solution SMS	<u>Updat</u>	te <u>Delete</u>	[Create a	new Action]
	3	serv	ice view	[view] [serv	ices]	view all services	<u>Upda</u>	te <u>Delete</u>		
	4 5	servi servi	ice infots ice view street	[info] [ts] [s [view] [stre	street] et]	See street condition view all street	<u>Updat</u> Updat	te <u>Delete</u> te <u>Delete</u>		
	6	serv	ice ts	[ts] [street [crowded/li	_point] ght]	update street traffic	<u>Updat</u>	te <u>Delete</u>		
						<u>Copyright © 200</u>	19 by Alfi	red Widjaya.		
				F	mire 5 '	20 Web Applicatio	on - 9	Services		
2	2		View cho	ngo		for solots view	, ,	Change log	data is	OK /
Z	3		view cha	nge	1. 0	set selects view			, uata 18	
			log		cl	nange log optior	1	displayed to	o user	Passed
										with no
										errors
	C Pa 200 200 Pa	han ge: tteTir 09-10 09-10 ge:	ge Log ne -20 09:46:35 -20 09:43:24	User +62856 +62856	S 1185700 si 1185700 si	treet Status enanyan light udirman crowded	► Hom	e Phonebook	▶ Service	▶ SMS → Change I
						Copyright © 200	9 by Alfi	red Widjaya.		
				Figu	re 5.21	Web Application	– Cł	nange Log		

Table 5.2 SMS Gateway Control Panel Testing