
DBConnection


Timer


SMS Sender


SMS Receiver


Send Test SMS


Receive SMS

Start

Project Briefing to NetApp-ATG

~ Vaibhav Jain

Project
Lotus

Agenda

1. Aboute Me
2. Demo
3. Deconstructing the Demo
4. Introducing Connect-Toolkit

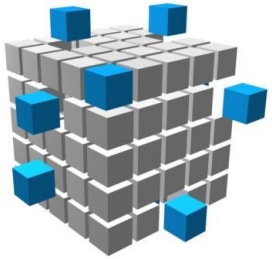
Professional Profile

- About 7 Years of professional experience in developing complex applications
- Have experience in diverse technological spectrums including Mobile/Web/Enterprises.
- Presently working at EMC Corporation on their flagship Networker/Avamar products.
- In the past have worked for Nokia for their N8 of mobile device. Worked on its S60 Web Browser based on the Apple Webkit.
- Worked as an intern/engineer at Impetus iLabs based in Indore.

Personal Profile

- Graduated with Masters in Computer Applications from S.G.S.I.T.S, Indore - 2007
- A self confessed geek who wrote his first code at the age of 12
- Love tinkering with both hardware/software
- Have founded and worked in a small startup called “Intellective-Solutions” that used to publish shareware software.
- In the past have taught computers & mathematics to school kids and adults.

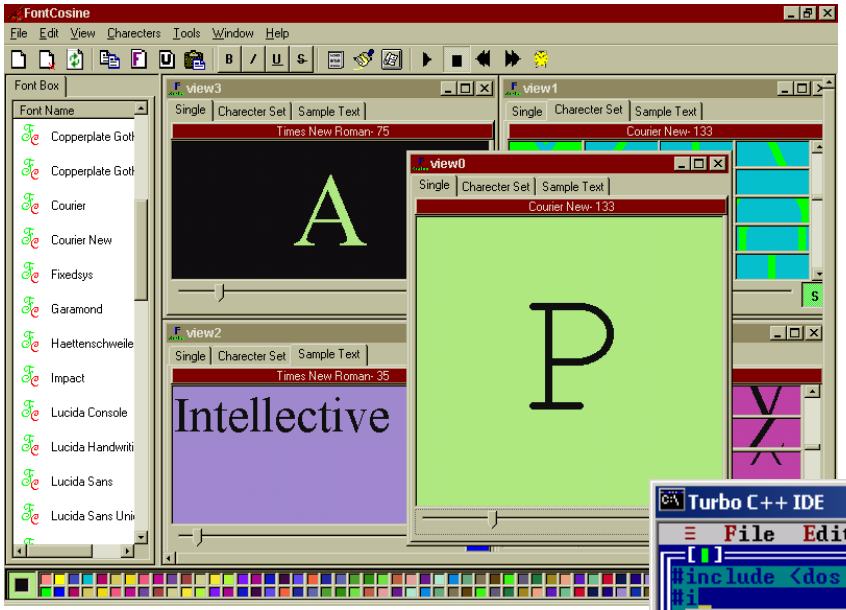
Current Assignment



" A new Block Based Backup feature for file systems that really screams, eliminating the walk of high density file systems and the creation of an index… yet, enables granular level recovery using the new Recovery UI. Best yet, this feature simply 'comes with' NetWorker! " - http://goo.gl/jPHcAV

- Use change block tracking to keep track of changed blocks on the disk.
- Incremental backups are very fast as only the changed blocks on the disk are backed up.
- Volume backups performed on a PIT snapshot.
- Restores are directly mountable on Hyper-V for quick Disaster Recovery.
- Own the backup workflow and the block tracking kernel-driver on Linux.

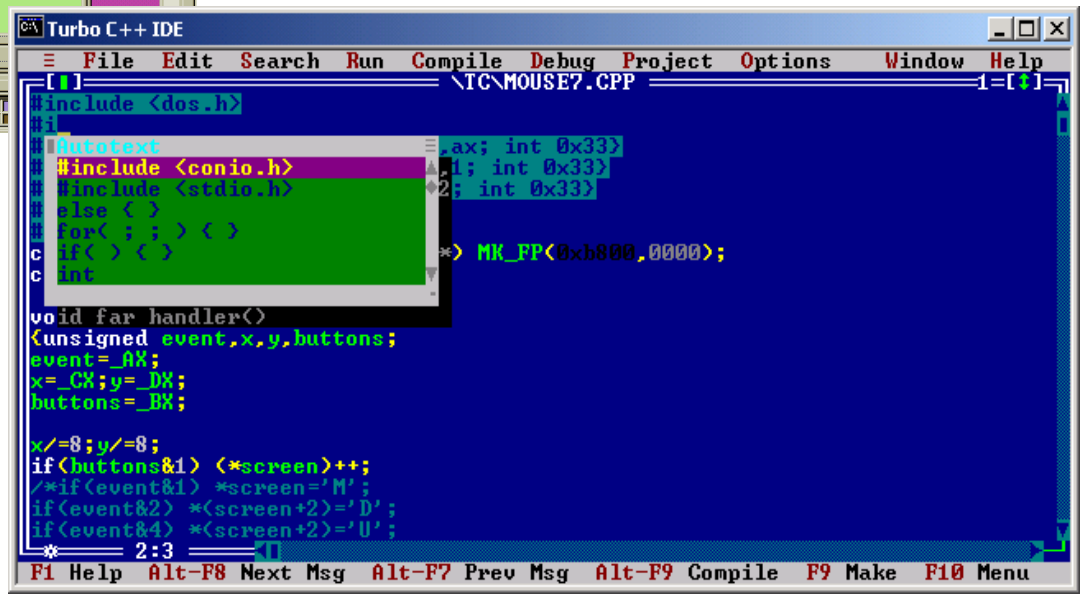
Some Personal Projects



FontCosine 1.0

Font Management and Previewing Tool

Shareware – 2000



Auto-Text

Autocomplete for Turbo-C

2004

Some Personal Projects

W-Mail

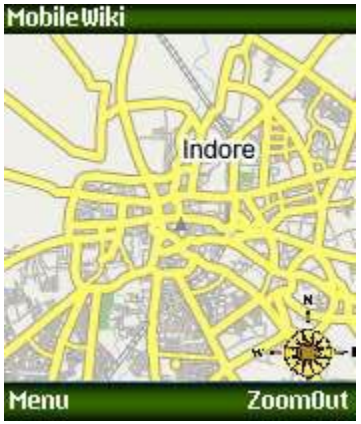
SMS Based Email System for the masses

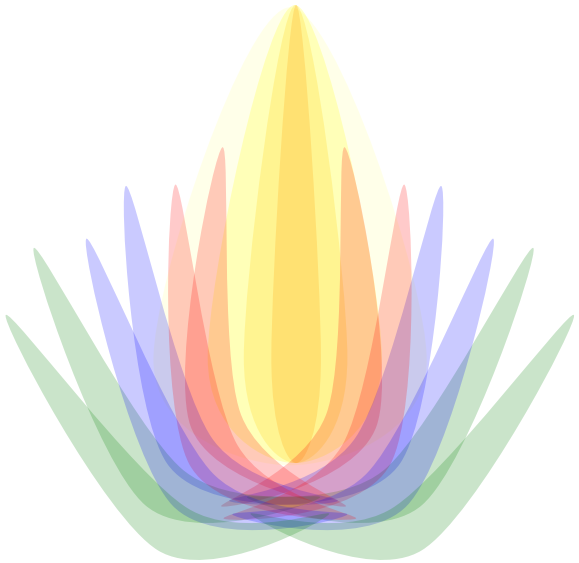
2006

Mobile Wiki

Geo tagging mobile-app using Google Maps

2007





Demo

Connect

Live Message Board

Message

Message

Message

Message

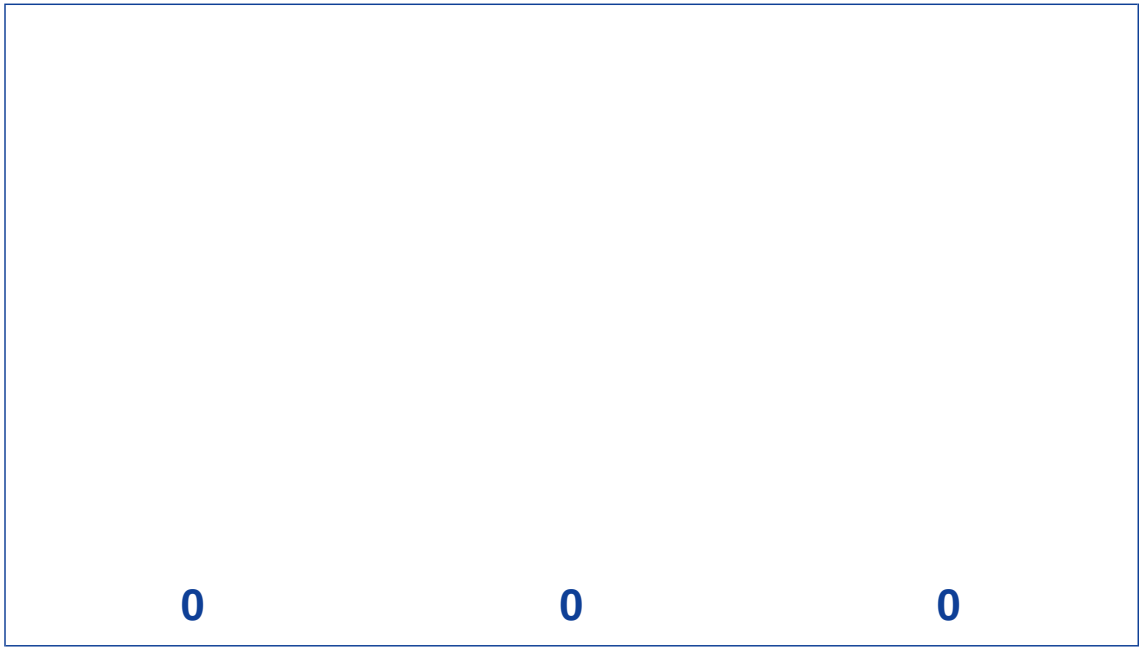
Message

Send your messages to 94253-45887

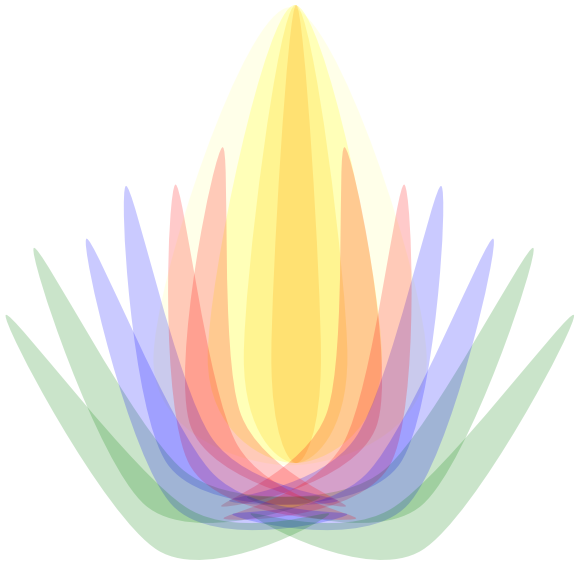
Connect

Audience Voting

Should mobiles be banned in colleges?

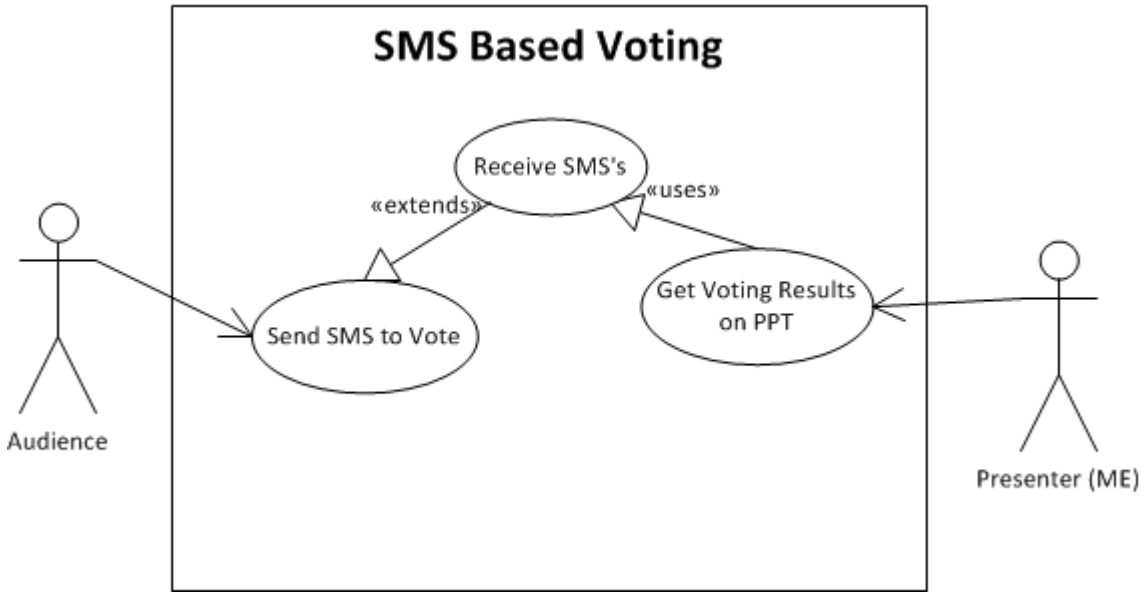


Send your opinion to +91-8861229883



Deconstructing the Demo

Main Use Cases



This translates to two major implementation challenges:

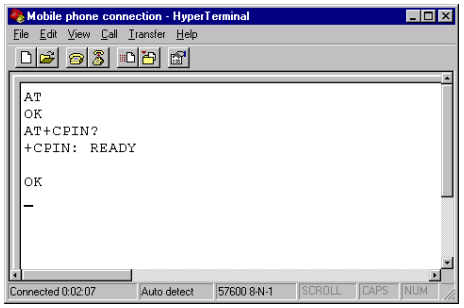
- The system should be able to receive (and send) voting SMSs
  - That's the main functionality
- The system should be able display voting results on the PowerPoint slide shown by the presenter.
  - Don't want the presenter to switch to a separate application to perform this use case.

Realizing Use-Case#1

"The system should be able to receive (and send) voting SMS"

DTE

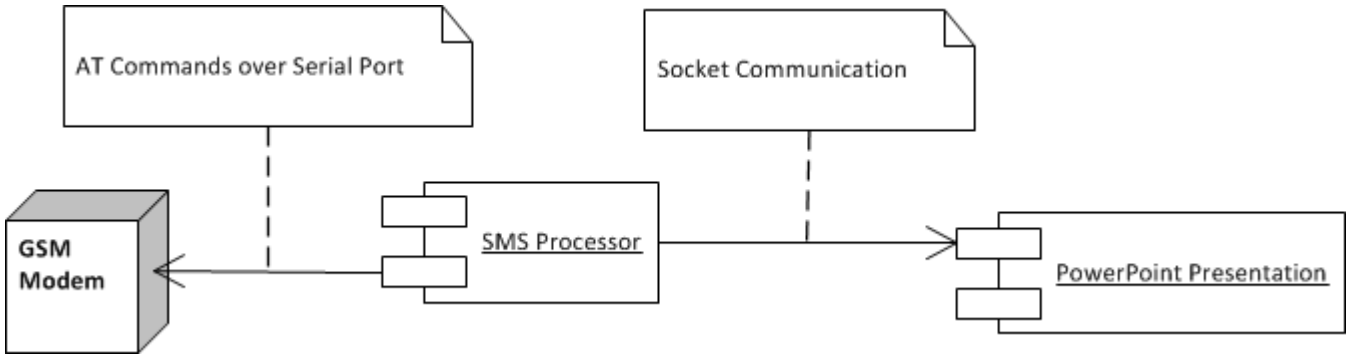
DCE



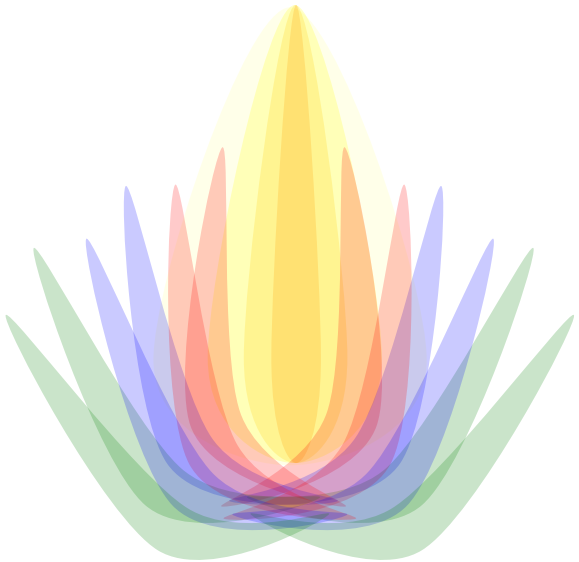
- Sending and Receiving SMSs can be achieved by using a GSM Device.
- The desktop essentially sees the GSM device as a Modem which is connected via a Serial port.
- Interaction happens when DTE sends AT commands over the link to the GSM Device (DCE).
- Send/Receive of SMS messages is achieved using AT command specific to GSM modems. E.g. AT+CMGS to send an SMS.

Realizing Use-Case#2

The system should be able display voting results on the PowerPoint slide shown by the presenter.



- PowerPoint programmability using Visual Basic for Application.
- Elements on a slide can be manipulated via PowerPoint object model.
- DCE isn't directly accessed from VBA so as to get a reusable sms processing module.
- Communication between SMS Processor and VBA be achieved using TCP-Sockets.



Introducing Connect-Toolkit

Introduction

- Connect is a reusable toolkit to send and receive Text message from a GSM phone.
- Developed as a part of “Project Lotus” in Jun-2006 which developed a product called WMail.
- ‘Connect’ was originally just a module for sending and receiving SMSs’.
- Demonstrated W-Mail professionally to my first employer Impetus Technologies, who saw some potential. So this toolkit was quickly branched out for use in many other projects.
- Finally a standalone component called “Connect-Toolkit” was created to making it easy to reuse.

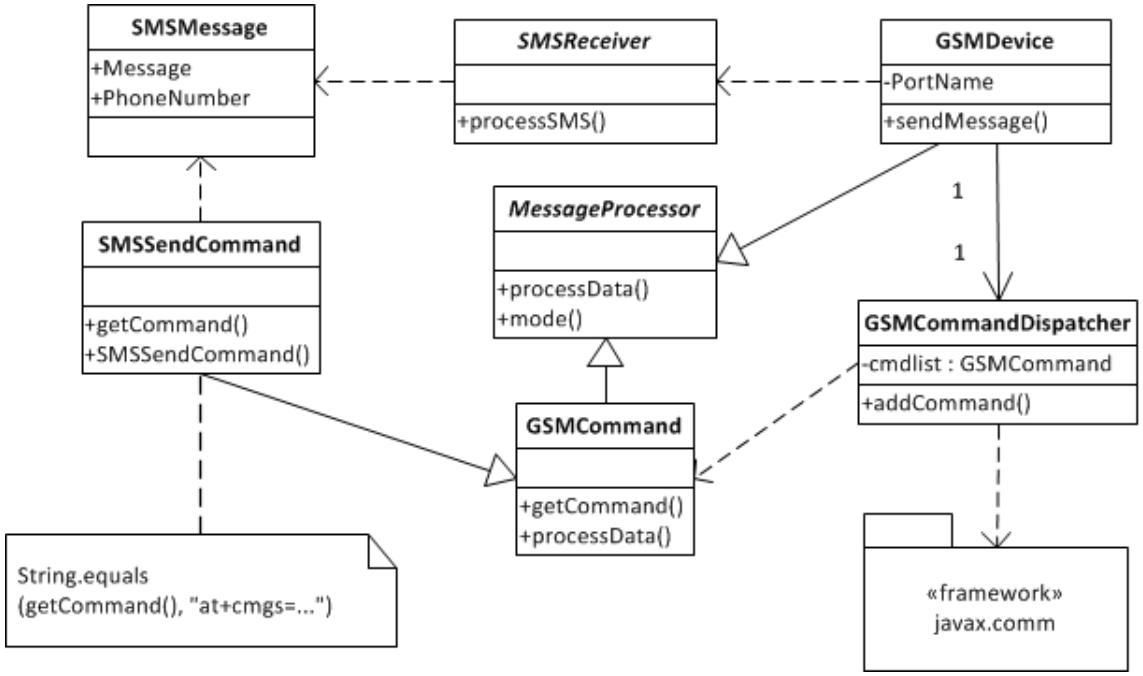
Technical Highlights

- Very simple to use and build applications around it.
- Capable of both sending and receiving sms messages using cheap hardware.
- Written completely in Java-SE so can be easily integrated to existing enterprise applications.
- Uses javax.comm api's to communicate over serial port.
- Installation & running costs are very small.
- Best suited for low volume/temporary systems.
- Was implemented using Rational Rose's Roundtrip Engineering capabilities.

Sample SMS-Echo Server

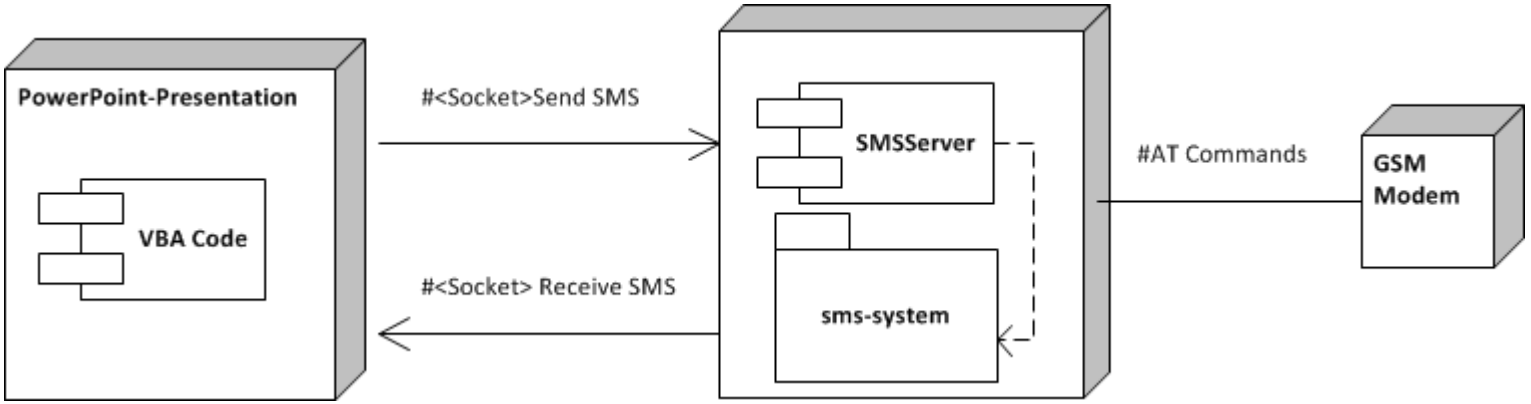
```
1.  import smssystem.*;
2.  public class SmsDemo implements SMSReceiver {
3.  private static GSMDevice gm;

4.  public static void main(String args[]) {
5.          gm=new GSMDevice("COM1");
6.          gm.addSMSReceiver(new SMSDemo());
7.        }

8.  public void processSMS( SMSMessage msg) {
9.          System.out.println("New Message From:"+ msg.getMessage());
10.         System.out.println("Message:"+msg.getPhoneNumber());
11.         gm.sendMessage(msg);
12.       }
13. }
```

Connect Toolkit Architecture



- Uses the Interpreter Pattern to process GSM Commands.
- GSM Dispatcher maintains a stack of Message Processors to parse output of various GSM Commands.
- In case the command stack is empty then it indicates a DCE notification which is then handled by the GSM Device.

Communication with PowerPoint



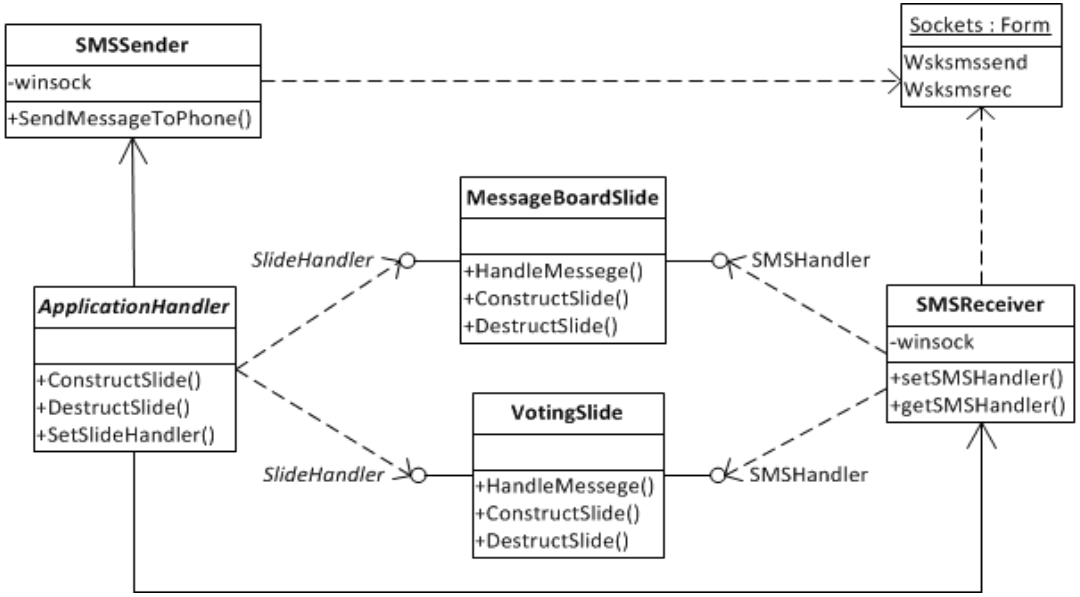
- Functionality of sms-system package is exposed from a process called SMS-Server.
- It exposes two tcp listening sockets which are for sending and receiving smss' respectively.
- Communication protocol is plain text and greatly simplified to have minimum processing overhead in VBA code.
- When the slide show starts, the VBA code initiates a socket connection to these two ports.

Processing in PowerPoint

- Processing within PowerPoint happens in VBA Code.
- The code makes heavy use of VBA features like Classes, Properties, Events and Polymorphism.
- Manipulation of Slide show elements is done via PowerPoint Object Model.
- Uses Winsock ActiveX controls on a hidden form to communicate with the SMS-Server.
- Code is based on clear separation of concerns making it very modular and extensible.
- Each dynamic slide is handled by a separate class derived from “SlideHandler”
- Every slide handler class has access to sms send/receive functionality.

Connect

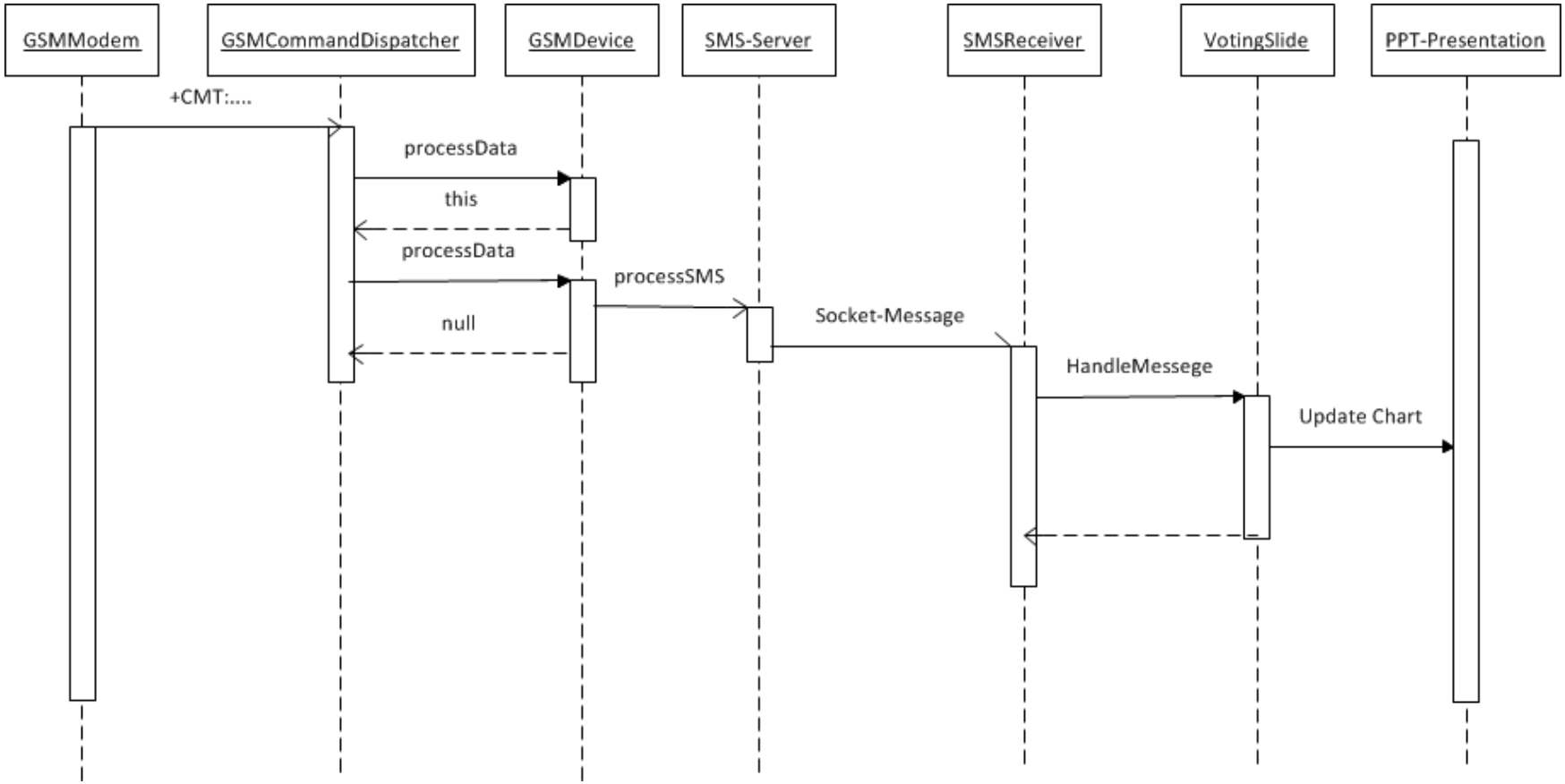
VBA Code Architecture



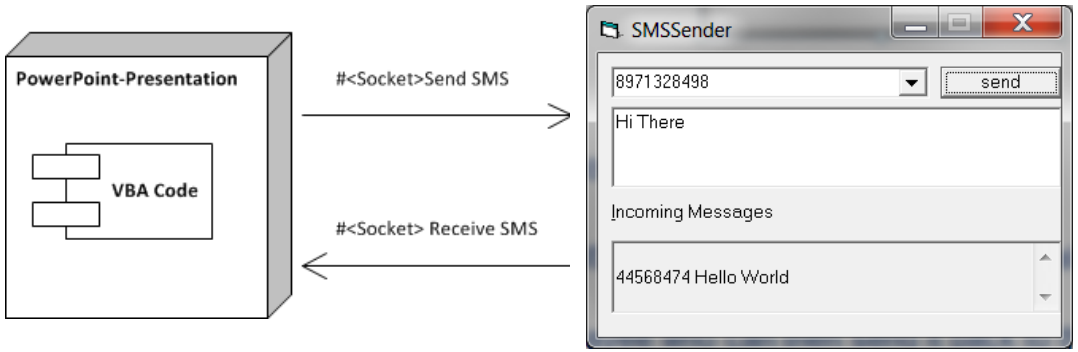
- The ApplicationHandler orchestrates the application and keeps watch on the slide navigation and when a dynamic slide is shown notifies the corresponding SlideHandler instances.
- Individual SlideHandler instances can implement the SMSHandler interface to receive SMS Messages.
- Receiving/Sending of SMS messages is handled in SMS-Receiver and SMSSender classes respectively.

Connect

Tying it all together



Testing Tool



- Testing/Development with live SMS-Server is costly and slow.
  - ≈ 30p/SMS in year 2006.
  - During peak hours SMS delivery used to be delayed by 10 Minutes.
- Solution was to create a SMS-Server emulator
  - Just like SMS-Server it used to listen on 2 ports for sending/receiving SMS's.
  - The simple UI would let simulate an incoming sms and display outgoing SMS's
- Was written in Visual Basic 6.0
  - It used the same ActiveX controls that were used in VBA code.
  - VB 6.0 had an integrated Packaging & Installer Tool which used to deploy the missing ActiveX controls on target system.

THE HINDU Business Line
Monday, Sep 10, 2007

Just use your cell-phone. N. SRIDHARAN

Mobile, mobile, make your point

Impetus Labs says its software can help you tell the speaker at the lecture whether he is boring, or straying, in real time.

L.N. REVATHY

Situation one: You are attending a lecture.. The speaker goes on and on.. You are either bored or wish the speaker would give a break, make the presentation more interesting, lively.

Situation two: The speaker keeps his audience spell-bound. So involved are you that you would like to make a valid point, right at that moment in the presentation.

In either case, how will you convey the message without embarrassing the speaker, without disclosing your identity or disturbing the decorum of the meeting?

"It is a simple but effective idea," says Vineet, Associate Director of Engineering at Impetus. This product (idea) was tested at one of the technical community camps hosted by Impetus.

"This happened at the Mobile Monday (MoMo) Camp. Some of the comments were hilarious," Vineet recalls.

(MoMo) Camp. Some of the comments were hilarious," Vineet recalls.

Does this system distract the speaker? "Actually not. In fact, every successive

's. The iLabs team that's on the
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s 'radars' of the company.
ore new technology domains
ess, mobile, new media, speech,
oIP, among others. Engineers
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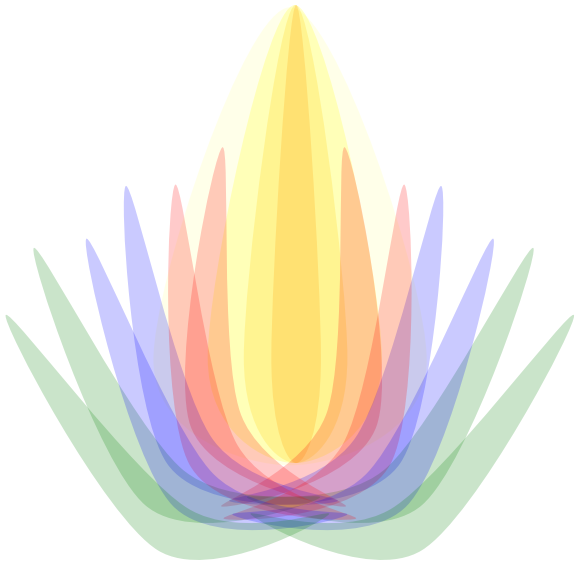
he technology space. They pro-
o the R&D team.
gs are shared with the engi-
neering teams through newsletters, seminars and open house discussion," says Vineet. Such initiatives, he says, shorten the development time by creating reusable com-

Some Other Applications

- SMS based mobile currency/payment solution.
  - Central server issues currency notes.
  - Each currency descriptor is a 20 byte MD5-HMAC followed by plain text value of currency note.
  - The currency note is sent to intended payee who can then send it back to the central server for verification/credit.

- Blood Donor helpline
  - Provides a quick way for people to find donors of a specific blood group.
  - A person just need to send a text message like “need blood O+” to the helpline number
  - The service will pick 3 random donors of the specific blood group and send it back.
  - Donors can also register by sending their blood group in a text message to the helpline number.



Thank You

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