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## Cutting Edge Symbian Development

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*"**Idhasoft** is a global world-class organization providing best-of-breed localized business and technology solutions, with continuous innovation and quality backed by best-in-class people"*

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The mobile and wireless domain has been a core focus vertical for GMI ever since the emergence of the industry sector. Over the years, GMI has built a competitive skill set that encompasses all wireless technologies and wireless networking platforms. GMI uses its proven expertise in entertainment and networking arena to augment the mobile internet revolution, creating streamlined solutions equipped with seamless wireless to web internetworking capabilities. GMI has extensive experience in the deployment of large-scale development projects in Symbian. From the development of typical mobile functionality enhancing applications like data-recording and SMS blocking tools to the implementation of exhaustive media streaming systems and advertising networks with wireless web connectivity, GMI has to its credit the most comprehensive portfolio of services across Symbian.

# Streaming Multimedia Content Distribution Over The Mobile Network

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The application is an interactive streaming multimedia system capable of audio and video content distribution over various mobile networks.

**Platform**
Series 60 SDK 2.1
Carbide Express C++ 1.1
SyExpat
Bluetooth and Sockets over GPRS

**Application Overview**
In addition to being an interactive streaming multimedia system, the application enhances video uploading and downloading for users by providing extensive features for creating tags for video uploads. The tagging process is implemented such that the tags can be edited while the video is being played (real-time) or after the video has done playing (differed-time). The tags are user-dependant and can be created in image, video and text format. Various video categories are incorporated and a superior video conversion engine has been exclusively created to make different video formats compatible for being played on various mobiles as well the PC. Communication part with server is carried out using sockets over GPRS and the system also ensures seamless video play through an intelligent backend process that provided breakfree streaming irrespective of the video size.

**The system comprises of two core components**

**Web Server**: Designed to run on Windows, the Web server makes it possible to configure and monitor the entire system. Besides keeping track of mobile & PDA users to display location-based content, the Web server also allows for centralized monitoring of the security.

**Connection Management**: Mobile users can connect directly to web server using GPRS, WLAN networks. Web pages were designed to handle communications by interacting with the database via the implementation of .Net, for security purposes.

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# Location-Based Services and Advertising Network for Mobile Devices

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The system provides an end-to-end, location-based proximity content distribution point server running on the Windows platform. The system makes data accessible to any wireless device enabled with the required downloadable wireless client, utilizing both Bluetooth and GPRS technology for communication. Interacting with wireless devices in range, the system forms a PAN, or a personal local area network in case of Bluetooth.

**Platform**
Series 60 SDK 2.0
Microsoft .Net 2003 with Carbide.vs and SyExpat
Bluetooth
HTTP using GPRS

**Application Overview**
The aim of the system is to provide state-of-the-art location-based content distribution services using short-range, low-power wireless networking technologies like Bluetooth, GPRS & WLAN. Through the software, mobile users can access Bluetooth, GPRS or WLAN network located at specific locations and access various value-added services in addition to localized information. All information based on the current location of the person is transferred to the respective mobile device using either 'push' or 'pull' mechanisms over wireless networks. Examples include the provision of localized WAP push services, location-aware entertainment-infotainment services, authorization, authentication and discovery of devices as well as services using ad-hoc network facilities. Support for long range wireless services based on GPRS, MMS and SMS technologies is also in the process of being incorporated.
The complete solution is targeted for effectively promoting infotainment services, business advertisements and marketing activities in shopping centers and plazas etc.

## The application's main components include

**Web Server**: The Web server uses HTTP protocol for communication with the Web browser.

**Mobile Client**: The Mobile clients uses Bluetooth stack (BTNode) for accessing mobile devices (in case of Bluetooth) or Packet based UDP / IP in case of GPRS

**Windows Desktop Client:** The Windows Desktop client uses internet protocols (TCP/IP) for the Web Server to communicate with windows desktop clients or Bluetooth stack (BTNode) if the PC is Bluetooth-enabled.

**SMS/MMS Gateway:** An integrated third party SMS and MMS gateway is used to support SMS and MMS ads.

# Wireless Network Strength Indicator

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The system provides an end-to-end, location-based proximity content distribution point server running on the Windows platform. The system makes data accessible to any wireless device enabled with the required downloadable wireless client, utilizing both Bluetooth and GPRS technology for communication. Interacting with wireless devices in range, the system forms a PAN, or a personal local area network in case of Bluetooth.

**Platform**
Symbian OS 2.x
Series 60 SDK 2.0
Microsoft .Net 2003 with Carbide.vs

**Application Overview**
Acting as a wireless network strength indicator, the application collects data points from Bluetooth GPS device, general data and voice call to gauge network performance through its two modules Client and Server. The Client module resides on the mobile phone and delivered collected information to the web-based Server module at specific time intervals, effectively monitoring the network performance.
The Client collects extensive voice data like call progress, status and duration of the call. The gathered GPS data includes date, time, latitudes, longitudes, altitude, HDG Speed (in knots) and number of satellites used in position. The Client also collects extensive general phone information like mobile date & time, software and phone OS version, IMEI, IMSI, network technologies, network, location and country codes, various IDs etc.

## The following components make up the application

**Starter module:** The Starter module serves as a recognizer DLL (.MDL) and is triggered automatically after every reboot, in compatibility with Symbian OS's behavior.

**Engine module:** Built as the Symbian server (.EXE), the Engine module serves as the collector and transporter of information regarding the network. The Engine module also handles the requests received from the User Interface.

**User Interface:** The User Interface is developed as a .APP file in Symbian. Enabling users to configure the system through numerous options, the UI also displays reports about data point collected and transferred. Other functions of the UI include starting and stopping the Engine, managing the secret key required to upload data to the server, configuring the Bluetooth GPS device and selecting an access point from the existing for GPRS connection.

# Mobile Spying Application

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The application is developed to record all SMSs, phone calls, GPRS events and multimedia messages from a mobile phone for parental monitoring purposes. The recorded data is sent to the server, which allows users to check the data after proper validation.

**Platform**
Symbian OS 2.x
Series 60 SDK 2.0 with Carbide.C++ Express

**Application Overview**
The application is developed to facilitate thorough parental monitoring of mobiles with provision for recording all SMSs, phone calls, GPRS events and multimedia messages from a phone. The system is developed in such a way that it stays invisible and cannot be accessed from the applications list. Instead, users are provided with a secret key and the application can only be accessed with this secret key, thereby ensuring data security. Effectively working as a spy, the system sends all the recorded data to the web-based server over GPRS. SMS, MMS, calls, GPRS events etc. are captured and uploaded seamlessly and require minimal user intervention. Users can check details of all the SMS, MMS, Calls and GPRS usages by logging onto the MPM server.

## The Symbian Spy App client consisted of the following components

**Spy App Starter:** Built as the recognizer DLL, the Starter is responsible for initiating the required executables.

**Spy App Capture Key:** The Capture Key validates the secret key and opens the graphical user interface (GUI) for users to view.

**Spy App GUI App:** Through the Graphical User Interface, users can initiate or stop the main collection and transport engine. The Graphical User Interface also provides numerous system configuration settings like GPRS access point, events to be captured etc.

**Spy App Collection Engine:** The Collection engine consists of four EXE files developed to perform the system's data capturing activities. These executables are Phone Capture EXE, SMS capture EXE, MMS capture EXE, GPRS capture EXE.

**Spy App Transport Engine:** The Transport module is responsible for uploading the data to the server in a specified format after periodic time intervals set by the user.

# GSM Based File Transfer Application

The application is a versatile data transfer system that also serves as a File Explorer and sends data over Bluetooth, IR or Data call.

**Platform**
Symbian OS 2.x
Series 60 SDK 2.0
Series 80 SDK 2.0
UIQ SDK 2.1

**IDE**
Microsoft .Net 2003 with Carbide.vs
Carbide.C++ Express 1.0

**Application Overview**
Developed for Symbian-based phones, the application is a versatile data transfer system that also serves as a File Explorer. Through the application, users can view all the available drives, directories and files on the phone as well as send files to other devices via Bluetooth, IR or Data call. The application enhances the data call facility to transfer data over a call in addition to providing other data transferring options such as Bluetooth & IR. The system uses High Speed Circuit Switch Data (HSCSD) to transfer data over a call. Unlike Bluetooth, the data call offers file transfer without any range restrictions.

## The system comprises of the following two modules

**Transport/Receiver DLL:** The Transport/Receiver DLL is a statically linked DLL built under Symbian platform which handles the transfer and reception of file over Bluetooth, IR (using OBEX) or using data call (using HSCSD).

**UI APP:** Through the user interface, users can view the Drives, Directories and files available on the phone. This module is build separately for all three platforms, namely S60, S80 and UIQ.

# LIBXML Porting Application

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The application enables users to dynamically update the content of an XML file on the phone using XUPDATE language.

**Platform**
Symbian OS 2.x
Series 60 SDK 2.0
Sablotron (XSLT/XPath processor)
Expat (xml Parser)

**IDE**
Microsoft .Net 2003 with Carbide.vs

**Application Overview**
The objective behind developing this application is to build a local HTTP server and provide features similar to 'XUPDATE' using XSLT/XPath processor on the Symbian platform. Since the implementation of XUPDATE requires XSLT/XPATH processor, Sablortron (C++ based XSLT/XPATH processor) is successfully ported on Symbian platform as a statically linked DLL. This enables users to dynamically update the content of an XML file on the phone using XUPDATE language.

**The application achieves this through three modules, namely**

**HTTP Server:** The HTTP Server is developed using the core client/server architecture of Symbian. The HTTP Server is capable of responding to HTTP GET and HTTP POST requests sent from the local browser. After checking for the object requested in the HTTP/GET request, the HTTP server uses XSLT or XPATH processor to create an object and then reply back to HTTP client (local browser).

**HTTP Server DLL:** The HTTP Server DLL is the statically linked DLL, providing an interface for the client to communicate with the HTTP Server.

**HTTP Conf API:** HTTP Conf API is the UI module developed for allowing users to configure HTTP server. Users can set host name, listening port, default home page and root directory, besides performing other functions.

# Mobile Offline Search Engine

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The application functions as an offline content searching engine on the mobile, providing an interface and method similar to Google.

**Platform**
Series 60 SDK 2.1
Carbide Express C++ 1.1
SyExpat
Lucene

**Application Overview**
Developed as an offline content searching engine for the mobile, the application is capable of searching for a given string locally in the content packages that reside on the mobile's storage card. The application is also equipped with an interface and functionality similar to Google search engine. The application is equipped with an HTTP server (local-host), which continuously alert for requests coming from the browser.
Upon receiving a search request from the browser, HTTP server opens the J2ME Lucene application and sends the search string. J2ME Lucene returns the result for that search string and the HTTP server then creates a HTML page for displaying it in the browser. When users click on any of the results, the Package Manager retrieves the content from the package, formats it and sends it back to the browser

## The application comprises of the following main components

**HTTP Server:** The HTTP server is responsible for serving the requests coming from the local browser.

**J2ME Lucene:** Lucene is the information retrieval engine (Search Engine) incorporated in the application.

**Package Manager:** The role of the Package Manager is to retrieve information based on criteria like location, length etc. from the Package, which is the content about the specific entity in compressed form.

# Mobile Portal Express Launcher

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The application enables access to a mobile portal by providing users with the ability to download and install a client application on their mobile handset, which stores the user validation information required for the mobile portal.

**Platform**
Series 60 SDK 2.0
Carbide Express C++ 1.1

**Application Overview**
The objective of the application is to provide users with the ability to download and install a client application on their mobile handsets. This enables users to launch the mobile portal on their handsets by storing valuable information like user name and passwords. Upon execution, the application opens the URL to the mobile portal in the handset's mobile browser and transfers the user's credentials to the website for one-touch authentication. Based on the user credentials entered on the device, the appropriate URL to the corresponding portal is launched. The Express Launcher application is designed for Symbian Series 60 based Smartphones.

# Mobile Media Streaming Application

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The system is a media streaming application that communicates with Mobile Media Server (MMS) and gets the list of media files available on the server, which can be then streamed on the user's phone.

**Platform**
Symbian OS 2.x
Series 60 SDK 2.0
SyExpat XML parser

**IDE**
Microsoft .Net 2003 with Carbide.vs

**Application Overview**
The system is a media streaming application developed for devices having a Series 60 User Interface and a Symbian OS version of 7.0 or higher. The application communicates with HTTP 1.1 compliant Mobile Media Server (MMS) and gets the list of media files available on the server, which can be then streamed on the user's phone. The application is developed as a single module and includes the provision for users to select particular media listed on the server. The application uses Symbian HTTP API to communicate with MMS. List of media is sent in XML format which the application parses using SyExpat (Sax based XML parser developed as a wrapper for Symbian using Expat) and displays the same in a list for users to select and stream.

# SMS Blocker Application

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Developed for providing enhanced security measures on the mobile phone, the application blocks unwanted SMSs before the default Messaging application can handle it.

**Platform**
Symbian OS 2.x
Series 60 SDK 2.0
Symbian Database

**IDE**
Microsoft .Net 2003 with Carbide.vs

**Application Overview**
The application is built as a UI based application (.APP) for blocking unwanted SMSs before the default Messaging application handles them, effectively providing enhanced security measures on the mobile phone. The application is developed in such a way that it automatically starts itself after installation. Provision for accessing the application through a password key has also been included in the design. The application uses Symbian Database for storing blocked numbers and is continuously active in the background for blocking the SMSs received from unidentified numbers. The application also notifies users about incoming SMSs so that they can take necessary action and users are also provided with the option of turning the Notification feature ON/OFF.

# Mobile Call Management System

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The application is a comprehensive call management system that allows users to completely automate their calls and messages in a secure manner.

**Platform**
Symbian OS devices having OS 6.1, 7.0, 7.0s and 8.0
Series 60 SDK 1.2
Series 60 SDK 2.0

**IDE**
Microsoft Visual Studio 6.0
Microsoft .Net 2003 with Carbide.vs

**Application Overview**
The application provides exhaustive control over call and message management by automating call and message replies for the user. Through the application, users can completely automate their inbound/outbound calls and 2 way SMS messages by responding to callers with personalized voice messages. The application is designed to be capable of identifying the caller, and after proper verification, the application plays a voice message prerecorded by the user for that particular caller. The application also ensures high data security by allowing users to encrypt and decrypt all inbound and outbound SMS messages.
Making extensive use of Symbian Telephony API (ETEL) and Messaging API (MTM), the application is built as a Symbian OS APP (UI Module) for performing a number of functions like assigning a message for particular contact, recording a default message and handling call, uplink and downlink of data over telephony, among others.

# Technological Expertise

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| **Platform** | Symbian OS v6.1, Symbian OS v7.0, Symbian OS v7.0s enhanced, Symbian OS v8.0a, Symbian OS v8.1 |
| **Frameworks** | UIQ, Series 60, Series 80 |
| **Programming Languages** | C, C++, Python, OPL |
| **Back End (RDBMS)** | Symbian OS Database |
| **Application and Service Development** | Symbian Exe, Symbian UI based APP, Static DLL, Polymorphic DLL, Symbian on device debugging through GDB, Symbian client-server architecture, XML, XSLT, File I/O, Accessing PIM Application |
| **Communication and Service** | Symbian ETEL (Telephony module), Symbian MTM (messaging type module), Symbian Sockets, Bluetooth, Infrared, USB, OBEX over Bluetooth and IR, Serial communication over IR and Bluetooth, Sockets over IR, Bluetooth and GPRS, Serial communication over GSM using HSCSD, TCP/IP, HTTP |

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