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SCHOOL MANAGEMENT SYSTEM

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# INTRODUCTION AND OBJECTIVE

## INTRODUCTION

The population of our country is increasing rapidly, but the resources for providing proper education to the children are limited. So we need to utilize our existing school management processes properly with the help of digital technologies.

Most of the schools are managed by a single authority like head master or a group of people like governing body. But in this fast paced world people tend to switch jobs. If the key people leave the school then the quality of education and school management deteriorates. There are so many dependencies on the school management personnel. We can eradicate this dependency by deploying a computerized solution for managing school.

Nowadays both of the parents are employed for most kids and they don’t have enough time to interact with teachers frequently. We need a computerized system to manage interaction between parents and teachers.

We will implement a school management system to address these issues and bring up an efficient system to manage activities of a school using single software.

## OBJECTIVE

School Management System is versatile and complete end-to-end school management software .School Management System is used to enhance the administrative efficiency of educational institutions. It is an interactive platform for all entities viz. Students, Teachers, Management, Parents. It is a simple yet powerful one point integrated platform that connects all the departments of an institution namely office, fee counter, library, hostel, stores, academics, activity center and so on.

# SYSTEM ANALYSIS

## IDENTIFICATION OF NEED

When I was a kid I saw my parents coming to the school for submitting the remuneration and other reasons. The entire data was written using pen and papers so undoubtedly it took lots of time completing even minor queries. Nowadays I see my relatives going to the school to admit their kids and they face huge problems as no proper procedure is followed even by larger and more reputed institutes. I have always felt that there is a need of a proper procedure which could not only save lots of time of both the school authority and the guardians, also easy to maintain the entire process. So I really feel that the modernization of technology could be used to minimize these problems. That is why a proper application or software is required to ease the task of the school administration and save the time of the parents as well.

## PRELIMINARY INVESTIGATION

I started talking to my relatives and neighbors who have recently admitted their child to the schools or they are in the process of admitting them. Naturally, they are the ones who know the problems very well. I also spoke with some of school administrations in my locality about the problems they faced and what exactly would they want if they are given software like School Management System just to get an idea on what could the points be if we want to develop a new application to minimize school management related problems and difficulties. I obviously then consulted with some IT professionals and software engineers and expressed my view to them. I was really amazed to see their positive response on this matter and I got helps in many ways from them. After completing all this process I decided to develop this application for sure.

## FEASIBILITY STUDY

We all know that the numbers of school is growing as fast as Information Technology. Developing an application is very easy these days so people would love to use technology ease their tasks. There is need and there is solution so undoubtedly this software is going to be appreciated by the market.

## PROJECT PLANNING

### TRACKING GANTT



## PROJECT SCHEDULING

### PERT CHART (NETWORK DIAGRAM)



### GANTT CHART



## SOFTWARE REQUIREMENT AND SPECIFICATION

### FUNCTIONAL REQUIREMENTS

#### View and Enter new Student and Employee information

**Introduction**

The details of a new student are stored into a student profile. Only School administration department can enter that details of new student but and teachers can only updated the existing student status. Details of employee are also kept into individual employee profile and it will also be updated by School Administration System.

**Input**

Relevant student and employee data like name, address, contact no., applying for which class.

**Processing**

Employee will enter data in SMS and create a new Student enrolment no, as well as a new code number for Employee.

**Output**

SMS will generate Enrolment no. for Student and Code no. for Employee .Details can be viewed later on whenever required.

#### View and Enter new timetable information

**Introduction**

Employee can view the time table and can also update the timetable information.

**Input**

Employee number, department number and Week range

**Processing**

Employee number and department number must be unique, and when entering timetable of any employee or teacher both values must be valid references. Week range must be between 1to 52.

**Output**

Teacher and Student both can see the time table.

#### Security

**Introduction**

Only the high level members of the School and Network manager will have access to the system for securing their important data from others.

**Input**

System username and password

**Processing**

The network operating system in the department will be used to enforce security. Another security level should also be incorporated to make the system more secure.

**Output**

All data are secured and that can be used in future.

#### Changing Password and Username

**Introduction**

Change existing username and password

**Input**

New username and password

**Processing**

Old username and password will be replaced by user provided new username and password after authenticating.

**Output**

Password and Username can be changed according to the Employee requirement whenever they want to change for better security of the System.

#### Mail Notification

**Introduction**

If holiday is declared suddenly, all students, teachers and employees are informed by sending them a mail.

**Input**

Student and Teacher’s name and email id.

**Processing**

Employee will enter the name, email id and reason of holidays in the SMS and it will generate a message.

**Output**

Employee and Students get a message from SMS.

#### Exam Grade Details

**Introduction**

Data sheets are prepared for individual class. And each datasheet is given via email to the student of the corresponding class.

**Input**

Student name, marks in individual subject, attendance, class performance**.**

**Processing**

Grade card can be generated for individual students. Exam administrators would need to be able to view, update, delete, print and add grade details.

**Output**

A printed Grade card can be given to the student as well as an email can be received by the student with Grade card.

#### Fees Details

**Introduction**

Fees details of all Students are kept and they are reminded after every 4 days after last date. Late Fee is also charged after last date.

**Input**

Student name, enrolment no, remaining fees, last date of deposit amount.

**Processing**

SMS automatically generates a message and send it to the student email id.

**Output**

Students are reminded after every 4 days after last date.

### non FUNCTIONAL REQUIREMENTS

* The software must have a easy to use graphic user interface as it is going to be used by all types of users, like professors and clerks.
* The software should be password protected to secure confidential data.
* The database must be encrypted so that no one could see the accounts information of the organization even if the database is somehow hacked.
* The application must be fast and flexible so that waiting time gets reduced.
* There must be a backup and restore feature so that the valuable data stays secure forever.

## SOFTWARE ENGINEERING PARADIGM APPLIED

Project Category

## DATA MODELS

### CONTEXT DIAGRAM



### DATA FLOW DIAGRAM (DFD)

#### LEVEL 0 DFD



#### LEVEL 1 DFD







#### LEVEL 2 DFD



### CONTROL FLOW DIAGRAM







### SEQUENCE DIAGRAM



### ENTITY RELATIONSHIP MODEL

We will design a RDBMS for School Management System. The entities and their attributes are listed below. Attributes in Bold letter is the unique key.

|  |  |
| --- | --- |
| **Entities** | **Attributes** |
| Student | **Student\_ID**, Student\_DOB, Student\_Name, Student\_Parent\_Name, Student\_Address, Student\_Admission\_Date, Student\_Course\_Name, Student\_Contact |
| Account | **Transaction\_ID**, Transaction\_Amount, Transaction\_Type, Transaction\_Reason,Account\_Balance |
| Admin | **Staff\_ID**, Staff\_Name, Staff\_Permission\_Level, Staff\_Address, Staff\_Admission\_Date, Staff\_Course\_Name, Staff\_Contract\_details, Staff\_Join\_Date, Staff\_Email, Staff\_Role |
| Books | **Book\_ID**, Book\_Name, Book\_Author, Purchase\_Date, Book\_Status, Book\_Description,Purchase\_Amount |
| Faculty | **Faculty\_ID**, Faculty\_Name, Faculty\_Address, Faculty\_Join\_Date, Faculty\_Course\_Under, Faculty\_Contact\_Details, Faculty\_Salary\_Details |
| Course | **Course\_ID**, Course\_Faculty, Course\_Name, Required\_Qualification, Course\_Fees, Course\_Admission\_Date, Students\_Under, Course\_Description |

**Relationship between Entities:**

School Management System has Courses 1 : N

School Management SystemhasStudents 1 : N

School Management System has Faculties1 : N

School Management System has Admin 1 : 1

Studenthas Attendance1 :1

AdminChecksAttendance1 : 1

StudentsreadsBooksM : N

StudentspaysAccount1 : 1

AdminControlsAccount1 : 1

Students Studies in Course N:1



### CLASS DIAGRAM / CRC MODEL /COLLABORATION DIAGRAM / USE-CASE DIAGRAM / ACTIVITY DIAGRAM



# SYSTEM DESIGN

## MODULARISATION DETAILS



School Management System is divided three main modules such as:

1. School Management Server
2. School Management Client
3. School Management Database

### SCHOOL MANAGEMENT SERVER

School Management server is a singleton server designed provide services for school management system. It controls various activities required for the school management system. To manage these activities it has several sub modules such as:

1. Admission Management
2. Student Management
3. Faculty Management
4. Course Management
5. Attendance & Leave Management
6. Library Management
7. Accounts Management
8. Administration Management

### SCHOOL MANAGEMENT CLIENT

School Management System will provide two different clients for the convenience of the user. Desktop client is for doing bulk activities and faster tasks. Web client will allow instant access from anywhere and anytime.

### SCHOOL MANAGEMENT DATABASE

School Management System will have a unified database for storing all the information. It can be a networked database or a database situated in the server machine.

## DATA INTEGRITY AND CONSTRAINTS

?????????? database related issues and limitations

## DATABASE AND TABLE DESIGN

The database used for this software is called **smsdb**. A screenshot from the MySQl workbench is given below. It shows the tables and its columns. The first row is the primary key.



## PROCEDURAL DESIGN / OBJECT ORIENTED DESIGN

## USER INTERFACE DESIGN

## TEST CASES

### UNIT TEST CASES

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **TEST CASE ID** | **ITEM** | **DESCRIPTION** | **ACTUAL RESULT** | **TESTED BY** |
| SMS – 001 | Login | Enter User ID and Password for Login. | Successfully Logged in. | Susmita |
| SMS – 002 | Cancel | Select Cancel to close Login window. | Successfully Canceled. | Susmita |

### SYSTEM TEST CASES

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **TEST CASE ID** | **ITEM** | **DESCRIPTION** | **ACTUAL RESULT** | **TESTED BY** |
| SMS – 001 | Login | Enter User ID and Password for Login. | Successfully Logged in. | Susmita |
| SMS – 002 | Cancel | Select Cancel to close Login window. | Successfully Canceled. | Susmita |
| SMS – 003 | Admission | To add a new student enter the Student\_ID, Student\_DOB, Student\_Name, Student\_Parent \_Name, Student\_Address, Student\_Admission\_ Date,Student\_course \_Name, Student\_Contact | New Student is added to the School Management System. | Susmita |
| SMS – 004 | ViewStudentStatus | Enter Student\_ID, Student\_Name, Student\_Course\_Name of the Student. | Show the Student Details. | Susmita |
| SMS – 005 | EditStudentStatus | Select the Student and Click the Edit option. Now edit the Student Details and submit the Details. | Student Details successfully updated. | Susmita |
| SMS - 006 | Faculty | To add new faculty enter Faculty ID, Name, Address, Contact No. etc details of the Faculty. | New Faculty is added to the School Management System. | Susmita |
| SMS – 007 | Submit | Select Submit to add the details of the Faculty. | Successfully added the details of the Faculty into School Management System. | Susmita |
| SMS – 008 | Cancel | Select Cancel to close the Faculty window. | Successfully cancelled. | Susmita |
| SMS – 009 | Course | Click Course to open Course window. | Successfully opened. | Susmita |
| SMS – 010 | Submit | Select Submit to add the details of the Course. | Successfully added the details of the Course into School Management System. | Susmita |
| SMS – 011 | Cancel | Select Cannel to close the Course window. | Successfully cancelled. | Susmita |
| SMS - 012 | Student | Enter the user id and password of the student. | Successfully login the Student into School Management System. | Susmita |
| SMS - 013 | Enter | Select Enter to show the details of the Student from Mobile. | Successfully shows the details. | Susmita |
| SMS – 014 | Result | Select Result for showing the marks of the student. | Successfully shown. | Susmita |

# CODING

## COMPLETE PROJECT CODING

## COMMENTS AND DESCRIPTION OF CODING SEGMENTS

## STANDARDIZATION OF THE CODING

## CODE EFFICIENCY

## ERROR HANDLING

## PARAMETERS CALLING / PASSING

## VALIDATION CHECKS

# TESTING

## TESTING TECHNIQUES AND TESTING STRATEGIES USED

We have vigorously tested the application to make it error free and smooth. To achieve our goal we tested the modules differently inside the codes and then tested the entire application as a whole to mark its drawbacks.

## TESTING PLAN USED

## TESTING REPORTS

### UNIT TEST CASES

|  |  |  |
| --- | --- | --- |
| Test Case Id | Comments | Status |
| SMS – 001  SMS – 002 | NA  NA | PASS  PASS |

### SYSTEM TEST CASES

|  |  |  |
| --- | --- | --- |
| Test Case Id | Comments | Status |
| SMS – 001 | NA | PASS |
| SMS – 002  SMS – 003  SMS – 004  SMS – 005  SMS – 006  SMS – 007  SMS – 008  SMS – 009  SMS – 010  SMS – 011  SMS – 012  SMS – 013  SMS – 014  SMS – 015  SMS – 016  SMS – 017  SMS – 018  SMS – 019  SMS – 020  SMS – 021  SMS – 022  SMS – 023  SMS – 024  SMS – 025  SMS – 026  SMS – 027  SMS – 028  SMS – 029  SMS – 030 | NA  NA  NA  NA  NA  NA  NA  NA  NA  NA  NA  NA  NA  NA  NA  NA  NA  NA  NA  NA  NA  NA  NA  NA  NA  NA  NA  NA  NA | PASS  PASS  PASS  PASS  PASS  PASS  PASS  PASS  PASS  PASS  PASS  PASS  PASS  PASS  PASS  PASS  PASS  PASS  PASS  PASS  PASS  PASS  PASS  PASS  PASS  PASS  PASS  PASS  PASS |

## DEBUGGING AND CODE IMPROVEMENT

# SYSTEM SECURITY MEASURES

* School Management System is password protected software. It will be developed such a way that the admin will have complete control on the school’s data.
* Admin can create account with various permission levels, like clerk, librarian, teacher, admin etc. so that the users can see relevant data only.

## DATABASE / DATA SECURITY

* The data of the school will be stored in the database with an encrypted format so even if someone hacks the database somehow still he can make no real harm.
* The software will provide a backup and restore feature in case of loss of data.

## CREATION OF USER PROFILES AND ACCESS RIGHTS

* The software asks for a predefined user-type, username and password to use its feature.
* All the data are not available for all types of user, for example, only an admin can use all the fields of the application. On the other hand, a clerk can only enter data and see data from some selected fields. A librarian can use library related data only.

# COST ESTIMATION

## COST ESTIMATION MODEL

??????????????????????????



# REPORTS

List of reports that are likely to be generated in this software are given below:

* Results & Grade report can be generated
* Class toppers will be given a certificate as a token of appreciation
* List of students can be generated
* List of teachers can be generated
* List of courses can be generated
* Course details can be generated
* Fund details can be generated
* Yearly donation report can be generated
* Salary slips can be created

# FUTURE SCOPE AND FURTHER ENHANCEMENT

* Mobile application could be developed for students’ guardians for querying about various details.
* Support for Linux operating system could be added.
* Online result checking and fees payment feature could be added.

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* <http://stackoverflow.com/>
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* http://www.mysql.com/support/
* <http://dev.mysql.com/>
* http://dev.mysql.com/support/
* <http://www.homeandlearn.co.uk/csharp/csharp.html>
* <http://www.wpftutorial.net/Home.html>
* https://www.facebook.com/
* <https://developers.facebook.com/>
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* <http://www.youtube.com/?gl=IN>
* <http://blendinsider.com/>
* https://github.com/
* <https://github.com/anirban-nandy>
* [https://github.com/anirban-nandy/DailyNoteBook](https://github.com/%20anirban-nandy%20/DailyNoteBook)
* <http://learn.github.com/p/intro.html>
* <http://www.vogella.com/articles/Git/article.html>
* <http://try.github.com/levels/1/challenges/1>
* <https://enterprise.github.com/support>
* <https://support.enterprise.github.com/home>

## Books

* **Programming Java** - E. R. Balaguruswamy.
* Fundamentals of software engineering by Rajib Mall.
* Pro C# 2010 and the .NET 4.0 Platform by Andrew Troselen.
* C# Programming by Rob Miles.

# APPENDICES

## IDE:

### (Visual Studio 2010)

Microsoft Visual Studio is a powerful IDE that ensures quality code throughout the entire application lifecycle, from design to deployment. Whether we are developing applications for SharePoint, the web, Windows, Windows Phone, and beyond, Visual Studio is the ultimate all-in-one solution. Visual Studio includes a [code editor](http://en.wikipedia.org/wiki/Code_editor) supporting [IntelliSense](http://en.wikipedia.org/wiki/IntelliSense) as well as [code refactoring](http://en.wikipedia.org/wiki/Code_refactoring). The integrated [debugger](http://en.wikipedia.org/wiki/Microsoft_Visual_Studio_Debugger) works both as a source-level debugger and a machine-level debugger. Other built-in tools include a forms designer for building [GUI](http://en.wikipedia.org/wiki/GUI) applications, web designer, [class](http://en.wikipedia.org/wiki/Class_(computing)) designer, and [database schema](http://en.wikipedia.org/wiki/Database_schema) designer. It accepts plug-ins that enhance the functionality at almost every level—including adding support for [source-control](http://en.wikipedia.org/wiki/Source_control) systems (like [Subversion](http://en.wikipedia.org/wiki/Subversion_(software)) and [Visual SourceSafe](http://en.wikipedia.org/wiki/Visual_SourceSafe)) and adding new toolsets like editors and visual designers for [domain-specific languages](http://en.wikipedia.org/wiki/Domain-specific_language) or toolsets for other aspects of the [software development lifecycle](http://en.wikipedia.org/wiki/Software_development_lifecycle) (like the [Team Foundation Server](http://en.wikipedia.org/wiki/Team_Foundation_Server) client: Team Explorer).

## Front End - WPF (Windows Presentation Framework)

Windows Presentation Foundation (WPF) provides developers with a unified programming model for building rich Windows smart client user experiences that incorporate UI, media, and documents. Windows Presentation Foundation (WPF) is a next-generation presentation system for building Windows client applications with visually stunning user experiences. With WPF, you can create a wide range of both standalone and browser-hosted applications. The core of WPF is a resolution-independent and vector-based rendering engine that is built to take advantage of modern graphics hardware. WPF extends the core with a comprehensive set of application-development features that include Extensible Application Markup Language (XAML), controls, data binding, layout, 2-D and 3-D graphics, animation, styles, templates, documents, media, text, and typography. WPF is included in the Microsoft .NET Framework, so you can build applications that incorporate other elements of the .NET Framework class library.

## Extensible application Markup Language (XaML)

XAML stands for Extensible Application Markup Language. Its a simple language based on XML to create and initialize .NET objects with hierarchical relations. Altough it was originally invented for WPF it can by used to create any kind of object trees.

Today XAML is used to create user interfaces in WPF, Silverlight, declare workflows in WF and for electronic paper in the XPS standard.

All classes in WPF have parameter less constructors and make excessive usage of properties. That is done to make it perfectly fit for XML languages like XAML.

All you can do in XAML can also be done in code. XAML ist just another way to create and initialize objects. You can use WPF without using XAML. It's up to you if you want to declare it in XAML or write it in code. Declare your UI in XAML has some advantages:

* XAML code is short and clear to read
* Separation of designer code and logic
* Graphical design tools like Expression Blend require XAML as source.
* The separation of XAML and UI logic allows it to clearly separate the roles of designer and developer.

## Programming Framework (.NET 4)

The .NET 4 Framework is Microsoft's platform for building applications that have visually stunning user experiences, seamless and secure communication, and the ability to model a range of business processes. The .Net Framework consists of:

Common Language Runtime – provides an abstraction layer over the operating system

Base Class Libraries – pre-built code for common low-level programming tasks

Development frameworks and technologies – reusable, customizable solutions for larger programming tasks.

The framework's Base Class Library provides user interface, data access, database connectivity, cryptography, web application development, numeric algorithms, and network communications. The class library is used by programmers, who combine it with their own code to produce applications.

## Database/backend - MySQL

MySQL is the world's most popular open source database software, with over 100 million copies of its software downloaded or distributed throughout its history.

The MySQL Community Edition includes:

* Pluggable Storage Engine Architecture
* Multiple Storage Engines: InnoDB , MyISAM, NDB (MySQL Cluster),Memory ,Merge , Archive, CSV
* MySQL Replication to improve application performance and scalability
* MySQL Partitioning to improve performance and management of large database applications
* Stored Procedures to improve developer productivity

## ide for Database –MySQL workbench

MySQL Workbench is a visual database design tool that integrates SQL development,administration, database design, creation and maintenance into a single integrated development environment for the MySQL database system. It is the successor to DBDesigner 4 from fabFORCE.net, and replaces the previous package of software,MySQL GUI Tools Bundle.

## Programming Language (C#)

C# is a type-safe, object-oriented language that is simple yet powerful, allowing programmers to build a breadth of applications. C# is a [multi-paradigm programming language](http://en.wikipedia.org/wiki/Multi-paradigm_programming_language) encompassing [imperative](http://en.wikipedia.org/wiki/Imperative_programming), [declarative](http://en.wikipedia.org/wiki/Declarative_programming), [functional](http://en.wikipedia.org/wiki/Functional_programming), [generic](http://en.wikipedia.org/wiki/Generic_programming), [object-oriented](http://en.wikipedia.org/wiki/Object-oriented_programming)([class-based](http://en.wikipedia.org/wiki/Class_(computer_science))), and [component-oriented](http://en.wikipedia.org/wiki/Component-based_software_engineering) programming disciplines. It was developed by [Microsoft](http://en.wikipedia.org/wiki/Microsoft) within the [.NET](http://en.wikipedia.org/wiki/.NET_Framework) initiative and later approved as a standard by [Ecma](http://en.wikipedia.org/wiki/Ecma_International) (ECMA-334) and [ISO](http://en.wikipedia.org/wiki/International_Organization_for_Standardization) (ISO/IEC 23270). C# is one of the programming languages designed for the [Common Language Infrastructure](http://en.wikipedia.org/wiki/Common_Language_Infrastructure).

C# is intended to be a simple, modern, general-purpose, object-oriented programming language.

## Dia for Diagram Drawing & Modeling

Dia is free and open source general-purpose diagramming software, developed as part of the GNOME project's office suite and was originally created by Alexander Larsson. Dia uses a controlled single document interface (CSDI) similar to GIMP and Sodipodi.

Dia has a modular design with several shape packages available for different needs: flowchart, network diagrams, circuit diagrams, and more. It does not restrict symbols and connectors from various categories from being placed together.

Dia is a gtk+ based diagram creation program released under the GPL license.

Dia is inspired by the commercial Windows program 'Visio', though more geared towards informal diagrams for casual use. It can be used to draw many different kinds of diagrams. It currently has special objects to help draw entity relationship diagrams, UML diagrams, flowcharts, network diagrams, and many other diagrams. It is also possible to add support for new shapes by writing simple XML files, using a subset of SVG to draw the shape.

It can load and save diagrams to a custom XML format (gzipped by default, to save space), can export diagrams to a number of formats, including EPS, SVG, XFIG, WMF and PNG, and can print diagrams (including ones that span multiple pages).

## Google Spreadsheet Interface:

*With Google Spreadsheets, we can easily create, share, and edit spreadsheets online. Here are a few specific things we can do:*

* *Import and export these file types: .xls, .csv, .txt and .ods. We can also export data to a PDF or an HTML file.*
* *Format cells and edit formulas so we can calculate results and make data look the way we want it.*
* *Chat in real time with others who are editing our spreadsheet.*
* *Embed a spreadsheet, or a section of a spreadsheet, in our blog or website.*

## Windows Mobile 6 Professional SDK

Windows Mobile is a mobile operating system developed by Microsoft that was used in smartphones and mobile devices. This features a suite of basic applications developed with the Microsoft Windows API. It is designed to be somewhat similar to desktop versions of Windows, feature-wise and aesthetically. Additionally, third-party software development is available for Windows Mobile, and software applications can be purchased via the Windows Marketplace for Mobile. Windows Mobile 6.1 was announced April 1, 2008. It is a minor upgrade to the existing Windows Mobile 6 platform which brings with it various performance enhancements, a redesigned Home screen featuring horizontal tiles that expand on clicking to display more information, although this new home screen is featured only on Windows Mobile Standard edition. This feature was inexplicably left out of the Professional edition. Several other changes such as threaded SMS, full page zooming in Internet Explorer and 'Domain Enroll' have also been added, along with a "mobile" version of the Microsoft OneNote program and an interactive "Getting Started" wizard. Windows Mobile 6.1 also featured improved bandwidth efficiency in its push-email protocol "Activesync" of "up to 40%", this reduced data usage was the cause of considerably improved battery life in many devices.

# GLOSSARY