

# **Absence Makes the Phone Ring Yonder**

*An end-to-end attendance recording and tracking system*

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**Abstract:** In New Zealand schools there is rising concern regarding pupil enrolment and absenteeism. MUSAC, a business unit of Massey University, has worked with two other service providers to devise an end-to-end tracking system for pupil attendance. The process begins with teachers entering attendance information by mobile phone and ends when the database is automatically updated with information returned by a caregiver contacted by automated voice or text message. The system utilises web services with mobile technology and the latest development tools.

**Keywords:** School attendance, enrolment, early notification system.

## **1. INTRODUCTION**

The New Zealand Ministry of Education currently has some concern regarding the number of students that 'disappear' from school enrolment. These disappearances typically occur when a child moves from one school to another whether it be at the same level (the family moves to a new location) or between levels (primary to intermediate, intermediate to secondary).

The reasons for these children failing to re-enrol in a new school are many and varied but, in some cases the caregiver either knows it has occurred and condones it or actually prevents the child from re-enrolling so they can help at home or assist with criminal activity.

To reduce this growing trend the Ministry has engaged accredited vendors in a pilot scheme which automatically notifies a Ministry server when a child changes to a leaver status. Basic details are deposited on the server and are only removed when that student is 'claimed' by the receiving school. The deposit and claim events are automatic and are managed using web services.

## **2. EARLY NOTIFICATION**

As an extension of this work, vendors have worked with the Ministry to deploy an Early Notification System (ENS) that can automatically contact caregivers whenever a child is absent from school. Notification occurs via synthesised voice message to a landline phone or cell phone, by text message to a cell phone or by email.

Secondary schools confront greater absenteeism problems than primary schools due to the need for students to frequently move between classes. There are many opportunities for students to leave the school grounds. Late arrival can also be a problem. Therefore uptake of this new technology is greatest in secondary schools at present.

The system is reasonably simple. Most schools take an early roll call and quickly enter the resulting data into a computerised tracking system (by 10am all absentees have usually been entered). The attendance officer then initiates the ENS program which lists all absentees, including primary caregiver contact details. Generally all are selected for contact but if necessary selected students can be omitted.

The data is then sent via a web service to the ENS server which begins contacting caregivers using a pre-determined escalation sequence. Typically the system tries first to deliver a voice message to a landline phone. If that fails a text message is sent to a cell phone. Next a voice message to a cell phone will be attempted and finally, if all else fails an email will be sent.

The system will learn which method is most successful for each caregiver and will use that method first the next time. If contact is made the caregiver presses keys on their phone to indicate whether or not they knew about the absence.

After a pre-determined time, usually about 1 hour, the school computer requests from the ENS server all results from contact attempts. This data is then used to automatically update the school attendance database. The system will print mail merge letters addressed to caregivers who have been unable to be contacted.

The system is able to free up the school attendance officer to work on higher level strategies for improving attendance by removing the drudgery of repetitive phone contact.

The ENS server is operated by a private company that charges the school on a per-call basis.

## **3. GATHERING ATTENDANCE DATA**

Presently there are a number of different approaches to gathering attendance data, though most schools handle it centrally by having one or two operators processing teacher roll returns which have been collected by the office runner. As technology and networks have advanced, more schools

are requiring teachers to enter their own roll check data using a terminal in their class room.

#### **4. ROLLTRACK**

MUSAC has worked with another private company to improve the way in which the attendance data is gathered by enabling teachers to send their return by cell phone. This system is known as RollTrack

Early in the day, the attendance officer uploads to the RollTrack server the entire days set of class lists. Teachers then log on to the service and download their class roll to the cell phone. They can scroll through the list and, with a few key presses can identify the absentees. They submit this data back to the service which is polled every few minutes by our software. Changes are uploaded and the attendance database is updated automatically.

The technology provider for the cell phones has prepared an attractive plan which includes free peer-to-peer calling and reduced rates on personal calls among other incentives. The system enables teachers to submit roll returns from traditionally difficult locations such as the sports field, school trips and camps etc.

The system takes advantage of state of the art computer and mobile communications technology to provide an end-to-end attendance recording and notification solution.

#### **5. GENERAL MESSAGING**

The ENS system also provides a general messaging service. MUSAC is currently the only New Zealand vendor that has implemented software to enable access to this service. We have used the distribution lists in Microsoft Outlook to provide contact details. The user can enter a message in text form which can be delivered (with mail merge capability for the student name) by synthesised voice or text to a landline phone or cell phone.

This enables quick efficient messages to be delivered to nominated groups such as board of trustees, parent teacher committee, sports teams and coaches, parent support groups and so on. Or if the occasion demands, such as flooding or other emergency, all caregivers can be efficiently contacted while staff are free to go about other more useful business.

#### **6. OTHER APPLICATIONS**

As MUSAC progresses with development of these products we are seeking new services that can be made available to improve data gathering and supply of on-demand information.

One such possibility involves enabling PDA style mobile phones to send anecdotal information about students to a central database. This information would be available to the pastoral care practitioners in the school and could be delivered to a PDA phone or computer terminal on demand.

## **7. PILOT DEPLOYMENT**

By December 2005 there were 10 schools installed with a pilot deployment. These schools provided feedback that enabled final honing of the product to suit a variety of situations and user preferences.

The school is able to install any one or more features of the package (RollTrack and/or Early Notification and/or General Messaging). The selection is generally based on financial considerations as each service provider charges an annual fee plus a volume usage charge.

MUSAC receives a small percentage of the volume usage charge, which is used to cover the cost of development and ongoing maintenance and support.

## **8. INITIAL FINDINGS**

By May 2006 there were three schools making regular use of ENS and two sites using RollTrack. Another 3 schools are piloting the ENS system.

One of the RollTrack sites is uploading 40 class rolls per day in a full deployment and the other is still in trial mode.

There are six schools using the early notification system (ENS). These schools are very pleased with the results and the most active are sending 20 to 30 caregiver notifications per day.

Both systems represent a significant commitment by the school because there is a service charge which has the potential to 'balloon' if not carefully monitored. Despite this cost we have found that schools have a desire to use technology to improve attendance monitoring and information systems. The ability to more reliably inform caregivers about their child's attendance is considered important.