The Journey to the Electronic Student Record

What is a Virtual Electronic Student Record?

A virtual Electronic Student Record (ESR) is a collection of student records that reside in a variety of information systems and locations and on multiple types of databases. It contains information from many student-related encounters. When we reach our destination, these records will collectively reflect the current student status and lifetime history of a student. The ESR is virtual in the sense that the information does not physically reside in one place. When viewed on a computer workstation, the ESR appears to be in one place. In reality, the individual records were retrieved from many information systems. One important point about the virtual ESR is that it does not "own" information; therefore it avoids the extensive cost and complexity involved in establishing and maintaining large repositories and warehouses of information.

Components of the Virtual Electronic Student Record

The virtual ESR comprises several important components:

- A "connectivity engine"
- A single sign-on
- Multi-system security
- Enterprise-wide Student Record Number
- Electronic document management
- Workflow

The "Connectivity Engine"

The "connectivity engine" is a cornerstone of the virtual electronic student record solution. It enables the ESR to reach out to a variety of disparate systems and repositories to retrieve and display the requested student records. The key benefit to using a connectivity engine is investment protection! Departmental and other legacy systems do not have to be replaced. The ESR solution simply connects to those systems to collect and display the requested records. Although this sounds like a simple task, it is quite formidable in the large multi-system, multi-platform environments that exist in today's schools, TAFEs and colleges. Complex? Yes, but a very necessary component of the virtual ESR.

Single Sign-On

Gaining access to records located in multiple systems normally requires signing in and out of those systems often moving from one workstation to another in the process. This is a frustrating and time-consuming task. An important aspect of the virtual ESR solution is that, through a single sign-on, authorised users are able to access information located in multiple information systems across the enterprise. The benefits of a single sign-on capability are obvious: simplicity and a great saving of time.

Multi-System Security

Providing secure access to student records located in multiple systems requires a transparent, multi-system security capability and is a significant responsibility the virtual ESR solution carries. Emerging security options such as biometric authentication (e.g. fingerprint matching, and Digital signatures) provide significantly enhanced security and eliminate the possibility of someone using another's user
code/password combination. Additionally, a vital component of any security system is the maintenance of a concise audit trail of accesses to students’ records. Any time a record is viewed, annotated, printed, faxed or manipulated in any way, an audit record should be automatically created. Paper tracking cannot be monitored this closely.

**Enterprise-Wide Student Record Number**

The enterprise-wide Student Record Number (SRN) accommodates multiple identification numbers for each student. The numbers are cross-indexed within the SRN in order to locate and retrieve records from systems in multiple databases. In much the same way as "connectivity" and "single sign-on", the SRN is complicated by the complex requirements of a multi-system enterprise environment.

**Electronic Document Management**

Another cornerstone of the virtual ESR solution is Electronic Document Management. EDM eliminates paper, saves time, reduces costs and enables immediate and simultaneous access to student records. Its associated "imaging engine" provides for the acquisition, storage, archival and retrieval of these electronic documents. Scanned images include enrolment applications and forms, student and parent surveys and other miscellaneous data. Additionally, electronic "documents" can be imported from other systems. Based on authorization levels, users can view, annotate, circulate and print student records. The original document is always maintained, but an audit trail tracks every change. This ability to implement procedures to track and effectively manage the electronic delivery of student records saves time and money and tightens control.

**Workflow**

The re-engineering and streamlining of departmental workflow takes place with automatic routing of electronic documents from one person or department to another throughout the process of completing a task. This automates once-manual tasks for efficient management, distribution and viewing of student records and electronic documents by authorised staff throughout the entire enterprise. It is this radical re-design of the old manual processes that provides the real return on investment for implementing the virtual ESR.

**Getting Started**

For many educational institutions, starting the journey is a difficult step to take. All too often, a plan is developed, re-evaluated, studied again, and never started. Those that have successfully begun have put a plan in place, a committed plan, and adjusted as changes in technology, requirements and resources occurred. Without exception, their advice is to "put a stake in the ground" and get started, knowing that mistakes will be made and that plans and priorities will change. Their vision to know where they want to go and their commitment to succeed are common threads among those successfully journeying to the virtual electronic student record.

**In Summary**

The road to the ESR has been paved. It may still take years to reach the point where complete student records are electronically available to all authorised teaching staff and administrators, anytime, anywhere. We all know it is a long journey, but when we reach the destination, teachers and administrators across the continuum of education will be able to simultaneously review and collaborate on the entire spectrum of information available about a given student - resulting in informed decisions, and a higher quality of education at a lower cost.
Ten Essential Attributes of an Electronic Student Record

Selecting the best ESR system for your student record system is one of the most important decisions you can make on the path to a paperless enterprise. As the demand for ESR systems grow, so do the number of new products. While many of these systems appear to offer similar functionality, there are inherent differences in each product. The following are 10 guidelines for selecting an ESR system/vendor that will achieve the highest level of productivity and cost savings for your organisation.

1. Process Improvement
To gain the full benefits of an ESR system, it is important to first ensure efficient and cost-effective work processes are in place. Make sure the vendor has the expertise to examine your work practices, offer recommendations for improvement, and implement or help implement them before you make a purchase decision. They should be able to provide proof of the return on investment, savings and efficiency gains you'll achieve by implementing the recommended process improvements and technology. Above all, they must involve all people affected by these changes and users of the system. This will help ensure buy-in and future success with the system.

2. Full on-site Planning and Implementation
Successful implementation of an enterprise-wide ESR system requires careful planning, as well as technical expertise. Look for a vendor that will support and guide you through this most vital process. On-site project management, interface customization, system installation, user training and ongoing 7x24 phone support should be included with your system. It is important that you are assigned an experienced project manager that will develop a detailed project plan for your school and oversee and monitor the implementation.

3. Modular, Scalable Design
Instituting an ESR system is usually a gradual process, often beginning with a departmental imaging system and building toward an enterprise-wide solution. The system you choose should be modular and scalable to grow as your needs grow, without requiring changes to your system.

4. Open Architecture
The ESR system should be based on industry-standard, open technologies for easy integration with various information systems. The ideal open system should use reliable, proven technology, such as UNIX and/or Microsoft Windows NT servers, any ODBC compliant database, name brand hardware and open standards such TCP/IP and SQL.

5. Customizable Workflow
Workflow is an essential component of any ESR system. With it, you can effectively manage and track all activities the system supports, greatly increasing staff productivity and efficiency. To gain the greatest benefit, make sure the system has a workflow component that can be easily tailored by you to match your work processes.
6. Customizable Security
Find an ESR system that enables you to administer security permissions to limit system access, application usage, printer, fax and E-mail access and document viewing, or any other criteria you establish. The system should give you the ability to assign permissions on a group or individual basis. Also, make sure system security includes full audit trail to enable the administrator to track all users' activities on the system.

7. Electronic Data and Scanned Document Support
To build a complete student record consisting of all student documentation, you will need an ESR system that incorporates both electronic and paper-originated information.

8. Remote Access Integration
Make sure the vendor can provide access to remote users either via a Web browser or modem connection.

9. Education Dedication - Proven ESR Success
Find a vendor with a proven track record of successfully implementing and supporting ESR systems in schools or equivalent. Talk to their customers to find out their experiences with the vendor and its products and, if possible, visit their facilities to see the system in action.

10. Applications to Improve Efficiency
The ideal system will include applications designed to automate specific work processes in your school and improve the overall efficiency of your operations.
ESR: High Quality & Low Cost

The Problem
More than 100 million student related forms are processed annually in Australia. Forms are used for enrolment, survey’s, examinations, attendance records, reports, excursions, research etc. This means that, at some point in its lifecycle, each form is re-keyed by expensive administration staff.

Historically, administration staff are employed to convert paper into electronic data because automated capture technologies, such as OCR/ICR, have not been able to cope effectively with the range of quality problems these forms present. Other problems include:

1. Multiple variants exist for form types.
2. People incorrectly fill in forms.
3. Effective automated ESR must not only read what is there, but also make intelligent decisions about what characters constitute name, address, date of birth etc. so the correct data elements can be exported to the database.
4. Finally, anything an individual typed on a keyboard contains errors. Keying errors must first be caught and then corrected.

The Solution
EDUforms is a production-proven solution for capturing and perfecting data from any form. The end result is far more cost-effective and accurate data, than key entry can produce. EDUforms is ready-to-run with full form templates and complete rules and dictionaries. A simple-to-use verifier allows the operator to select which fields to read, flag, correct and export.

EDUforms is based on TRI-CR recognition technology designed expressly for forms processing. Our proprietary recognition technology uses field structure and dictionary information inside the recognition process. This improves total capture accuracy, internally validates data, catches errors in original data and dramatically reduces the cost to convert each form.

1. EDUforms individually identifies and registers forms. No form lines are required to find data fields. A mixed batch of forms are quickly identified and processed.
2. EDUforms recognition algorithms have been trained on the largest group of fonts and characters.
3. The user can define “must have” fields. Those that are incorrectly left blank are flagged and displayed in Verify module. The operator has the option to fix it or reject the whole page for exception processing.
4. EDUforms catches errors in original data. This is done when data is read at high confidence, but the information is not consistent with the rules for that field or does not agree with related information in other fields.
5. EDUforms can ensure that business rules written into a particular form can be automatically processed, without delay and automatically exported to the relevant database(s). Multiple exports are available, and multiple database types catered for.
6. Look-up tables can be integrated into individual fields of a form so enabling checks and balances to be initiated at the time of processing.
7. Forms designed and exported using the EDUforms designer module, can be posted directly to the Web-site/Intranet site for electronic submission. Using the PDF+Forms module and the ability to export and import in PDF format allows the user to utilise the world standard PDF format.
A student, parent, teacher or administration staff member completes a form. The form or
document is then forwarded for processing by one of the following input devices.

**Input Devices**

The process of submitting a form can be by one of the following:

- Paper based forms – Facsimile or Scanner.
- Electronic forms – HTML, PDF or Email.

The forms are stored in a central directory, as an image ready for processing.

**Data Validation and Verification**

The data capture processing software is comprised of two modules - the Reader which reads and
identifies the form, performing various validation checks against tables and databases and the
Verifier which is used to validate any questionable data that the reader rejects.

Upon completion the data is then automatically exported to any ODBC compliant database.

**Data Storage**

The data, which has been exported, is stored in the pre-selected data format (ie. SRN, Date,
Surname, Document Type etc.) for quick and easy retrieval by a teacher or administration staff
member. The student folder is created and using the SRN as the key data point all future
information is stored in the Student’s folder. Just like a folder in a filing cabinet.

The student information is stored in a central repository or database. Other databases can be
linked to the central repository by way of a connect agent. This connectivity between databases
means other student information from multiple departments can be accessed via the central
repository.

It is important to note that beside documents other file formats can be stored ie. Video, and
voice.

**Departmental Viewers**

A teacher or administration staff member can access a student’s record from anywhere within the
school or via a secure browser. The search of the central repository can involve multiple
databases and the key search criteria based on the SRN, Surname, DOB and any other designated
field. This direct access to an electronic record enables key staff to have access to critical student
information within seconds.

A student record can not only be viewed but also can be delivered via an output device.
Output Devices

After a successful search of a student record, information can be printed, emailed or faxed. The following are the output devices supported:

- Printer
- Facsimile
- Electronically – via Email.