Realising the importance of data in the education sector

> **Data Driven Business Tools**

PROCESS - ANALYSE - DISSEMINATE

SPACE
TIME
RESEARCH

What is longitudinal data?

A dataset is longitudinal if it tracks the same type of information on the same subjects at multiple points in time.

SuperSTAR was designed to provide direct access to the lowest level of data such as student test results or individual student records over time. There is no need to summarize the data and lose detailed, granular access control as is the case with many traditional OLAP systems.

All the data is available through simple drag and drop interfaces. This ease of use, coupled with a high performance database engine enables users to perform 'what-if' analysis and uncover patterns that would otherwise remain hidden.

Since data is stored at the lowest level it is easy to identify records to the finest details of large classifications such as student record type, result and time. The simple hierarchical presentation of classifications allows for quick navigation to the lowest level of interest.

Educational institutions recognize the value, and importance of monitoring and analysing student performance from pre-school through university and vocational education.

As such, more and more data is being generated which leads to challenges in efficiently managing, fully leveraging, and safely protecting large datasets.

Types of educational data:
> Individual performance/reports
> Institution performance metrics
> Course enrolments
> Educational funding data
> School enrolment demographics

The Challenges

To find cost effective and innovative ways to organize, use and share information to improve services.

Maintaining the confidentiality of or protecting the general privacy of individuals, is becoming increasingly important for the public.

Using educational data

The SuperSTAR suite provides a number of 'out-of-the-box' data visualisation capabilities.

The views include:
> cross-tabulation (TableVIEW)
> geospatial analysis (MapVIEW)
> relationship analysis (Thematic Tables)
> direct record drill-down (RecordVIEW)
> charts (ChartVIEW)

Thematic Tables and MapView illustrate the how the views can be used to uncover patterns and trends using the web dissemination tool, SuperWEB2.

Leveraging educational data

SuperCROSS is the desktop client to Space-Time Research's online micro-analytical processing technology. It provides a powerful and intuitive graphical user interface that represents many years of experience in meeting the needs of the world's leading knowledge makers—national statistical agencies. SuperCROSS allows for the advanced querying of disparate data sources and the creation of multi-dimensional tables by school personnel users. These results can then be made available to the general public via SuperWEB2.

No-programming analytic interface

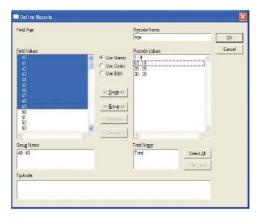**All common statistical functions**

Statistics such as sum, top and bottom contributors, median, percentiles, mean, variance, standard deviation can be created easily without programming.

Data

Data recode

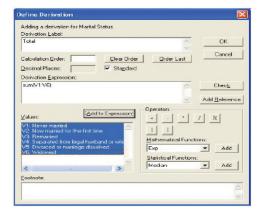Classification recoding (grouping into custom bands).

On-the-fly, in the process of "Query-Answer-Query", users can create custom groupings for fields such as age, gender, educational level, school, district or town without programming.

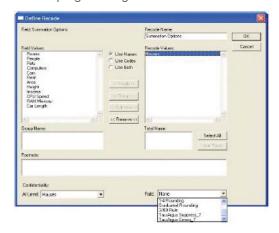### Creating calculations

Using the Derivations dialog

Calculations such as totals, percentages and averages can be quickly created without programming

Confidenitality

Multiple Confidentiality routines

Users can select multiple functions including techniques such as Perburbation to protect confidentiality of data reported in tables without programming.

Data responsibility

Managing the data

Millions of records can be integrated from across an entire educational system with control over access to and analysis of sensitive unit record data.

Controls are provided to protect and prevent common analytical user errors such as counting the wrong student unit number, are prevented by warning messages and default table selection.

HR login:

Administrator login:

Managing the Metadata

Access to comprehensive metadata allows users to identify, locate and understand data held in the datamart, leading to improved understanding among all information users and greater ability to scrutinise the effectiveness.
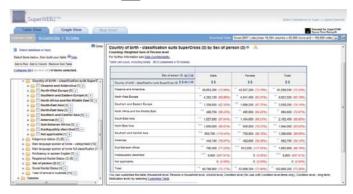
Web dissemination

The SuperSTAR web data dissemination solutions put users in the drivers seat offering unparalleled flexibility in table construction and manipulation. Data can be visualized as charts, maps and relationships. These out-of-the-box solutions plug neatly into existing school and other educational institution websites and can be installed with minimum configuration.

Benefits of SuperSTAR dissemination solutions are:

> Improved information available to schools and the public

> Improved efficiencies in the administration of student performance

> Less demand for school administration to answer basic public inquiries

> More transparency in institution performance metrics

> Reduced delays in the flow of information between school departments

> Improved flow of information between school districts on enrolment figures

> Increased ability to make informed decisions on policy, programs and budget

> Easy to use interfaces with no programming required

> Makes the most granular of data more readily and widely available to all users

> Single source of data facilitates more efficient and effective analysis

> Greater data integrity by eliminating the need to query separate repositories

> Improved ability to view historical data and track a cohort over time for trend monitoring and analysis

> API designed to pass out tabulation results to external confidentiality systems where they are confidentialised (altered or suppressed) and passed back to SuperSTAR

> Options to confidentialise student unit record data.

SuperWEB2™

Security and confidentiality

Maintaining the confidentiality of information about individuals or in this case students, or protecting general privacy of individuals, is becoming increasingly important in both business and for the public. The SuperSTAR suite has a number of out-of-the-box confidentiality protection routines as well as an API allowing third party routines to be used.

> Confidentiality / Disclosure Control (rounding and cell suppression)

> Perturbation (adjusts cell values by small amounts)

> Relative Standard Error (plugin allows you to show RSE figures in SuperWEB2 for weighted databases)

> Scaling Factor and Precision (scaling plugin, outputscaling.dll to set a scale value to be applied to each cell in the table)

> Sparsity (prevents the release of tables that contain a high proportion of cells with very low values (0,1, or 2)

> Weightings (configurable in SuperSERVER)

These confidentiality protection routines coupled with the tabulation performance of SuperSTAR enable micro-data access to be performed online. The confidentiality routines can also be used to ensure outputs such as publications or aggregated datasets do not disclose any confidential information about individuals (student records etc.).

Conclusion

With a no-programming user interface and advanced data management and access technology, SuperSTAR is uniquely capable of addressing large volumes of confidential data with creative approaches to Query—Answer—Query data analysis, reporting, and visualization. Statistical processing and analysis, information research, business intelligence functions, and web-based content delivery support Educational requirements and motivations. Space-Time Research has the software, solutions experience, industry partnerships, training, and technical support to ensure rapid, successful installation, integration, and implementation.

Educational Data > Critical Insights > Online Anytime