

The Smart Courier® for Healthcare
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INTRODUCTION

Many analysis and reporting products exist to support analysis and reporting needs, but often fall short of being able to provide these capabilities in situations where: 1) data structures are complex; 2) significant data manipulation is required between the data query and the final report; 3) industry knowledge requires custom functionality; 4) complexity requires programmer based report development, and 5) complexity requires an interface that guides and protects the end user. Effective industry or departmental specific data analysis and reporting requires business intelligence, extended technical capabilities, and a custom interface. That need has now surfaced in the software industry with the development of vertical market solutions including CRM (Customer Relationship Management), SRM (Supplier Relationship Management), Balanced Scorecard, and SAS vertical market products such as SAS Human Capital Management, SAS Risk Management, SAS Quality Improvement, SAS IT Management, and SAS Financial Management.

The required capabilities and industry intelligence can be built to provide users with many more capabilities than an off the shelf tool. The power of SAS software has always lied in its tremendous ability to manipulate the data. The secret is to look for the commonality of data manipulation needs across industries versus industry specific data manipulation needs. These data manipulation needs can be identified, captured, and surfaced in point and click interface to support extended end user reporting.



THE SMART COURIER FOR HEALTHCARE

TEC Associates industry focus is healthcare; as all staff have many years experience working for Blue

Cross Blue Shield plans and hospital health systems. This experience includes analysis and reporting throughout these healthcare organizations including marketing, actuarial, utilization review, claims processing edit identification, case management, medical policy development, claim auditing, etc., to support private insurance, individual insurance, Medicare A and B, Medicaid, Champus/Tricare, and state Risk Pools. We have thorough knowledge of the data at its lowest level and know what the healthcare user needs for analysis and reporting. With this knowledge and today's technology advances, TEC Associates is developing a group of software products called The Smart Reporter. The first in this family is The Smart Courier for Healthcare.

The Smart Courier provides meaningful actionable information to control costs and quality of care, set up and maintain provider networks, meet NCQA requirements, medical review, utilization management, identification of case management opportunities and wellness programs, audit of claims processing accuracy, employee benefit design management, and more! The Smart Courier will support the analysis and reporting needs of health care companies including insurance companies, HMO'S, Third Party Administrators, hospitals, self-insured companies, provider networks, Medicaid MCO'S, Medicare contractors and many more.

The Smart Courier provides a user interface, predefined reports in many categories, allows customer reports to be added, and allows the customer to tailor the application to meet their ongoing needs. The Smart Courier has achieved tremendous functionality in an easy to use point and click environment. The spectrum of ease of use and functionality are typically at opposite ends of the spectrum, but with extreme knowledge of the data and the direction, both can actually be achieved!

HEALTHCARE INTELLIGENCE

The healthcare industry is based on very complex underlying data. This data world consists of industry specific variables with industry defined values, industry specific variables with company defined values, industry specific variables with both industry defined values and company values, company specific variables, and transaction based rows that often need to be combined prior to analysis and reporting. Healthcare data also has many common data issues including multiple member or provider ids for the same person, providers with multiple specialties, claims paid in error and corrected creating multiple transactions for the same service, multiple claim types with some of the same variables and some unique variables; the list goes on. The data is known, the issues are known, the commonality across all healthcare companies is known, and the differences between healthcare companies is known. With this ammunition, TEC Associates designed a technical infrastructure that shares the commonality and allows for the differences. The differences become part of the custom installation of The Smart Courier. A part of the custom installation is the identification and handling of data issues. The Smart Courier can access the customer's existing data warehouse through the development of a custom query module, or TEC Associates can build our standard star schema data warehouse for healthcare.

The Smart Courier contains provisions for healthcare business intelligence including claim adjustment logic, continuous enrollment, and member months. Custom routines must be written to implement the appropriate logic for each customer. The Smart Courier contains 3 user options for the application of claims adjustment logic: 1) no adjustment, 2) adjusted per the last data refresh, and 3) adjustment as of the last user selected paid date. As of the last user selected paid date offers the advantage of being able to balance to reports ran previously, which is often needed for financial and actuarial reporting. Continuous enrollment allows reports to be generated based on claims for persons with a certain number of months of continuous enrollment in the health care plan. Member months is an industry specific statistic that counts members for each month they were active in a healthcare plan.

EXTENDED TECHNICAL CAPABILITIES

The Smart Courier contains extended technical capabilities required by the healthcare industry including: 1) Combining disparate data from multiple claim types including Institutional Inpatient, Institutional Outpatient, Non-institutional/Professional, Drug, and has an infrastructure for unlimited claim types; and without any burden on the user to do so. 2) Subset variable list contains only those variables that are valid for the selected report. The list is also diminished by variables already subset and part of the WHERE clause. 3) WHERE clause values can be edited without starting the WHERE build over. 4) WHERE clause within claim type is saved for the next report so the user does not have to enter a WHERE clause for each report. This is valuable when the user is tracking a particular subset through multiple reports. 5) Claim types can share a common WHERE clause, part of a common WHERE clause, subset differently by the same column, or subset by different columns. This provides the maximum flexibility of building WHERE clauses and what off the shelf product can accomplish this! 6) Fixed WHERE clauses for reports that require a specific WHERE clause. 7) Fixed claim type selection for reports that require specific claim types to be selected. 8) Columns on enrollment / membership tables and provider master tables can be reported along with claims based columns. These variables are added After the claim query; thus minimizing response time. 9) Claim service and paid dates are subset together to allow for date verification. This information is also used to build an optional date title for reports. 10) Sophisticated subset window to search, select, and manage large selection lists with many thousand rows. The healthcare industry contains codes for columns such as diagnosis, procedure, DRGS, NDCS, etc. These coding systems often include over 10,000 values; which can be difficult to manage with off the shelf product WHERE clause builder. The Smart Courier has a Where clause code finder which allows users to do searches on associated code text descriptions, code ranges, and use of the 'not in' operator. Many more small technical requirements were built or extended from traditional off the shelf non-industry specific reporting products.

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The Smart Courier offers data protection to insure data is handled correctly and reports contain valid information. How? Internal parameter tables control what subset columns are valid on a per report and per claim type basis; they control what claim types are presented on a per report basis, if a WHERE clause is required (as are for Hedis reports), it is fixed and can not be altered by the user; if specific claim types are required for a report, they are fixed and can not be altered by the user. The user is guided through the report generation process and only valid options are presented to the user.

REPORTS

The Smart Courier contains several report categories including: 1) Customer, 2) Fraud and Abuse, 3) Health Care, 4) Hedis, 5) My Reports, 6) Provider Profiling, and 7) Smart reports. The Smart Courier comes with the report categories; Fraud and Abuse reports (limited number as of 6/2002), Health Care, and Smart reports. Optionally, Hedis and Provider Profiling (not yet completed as of 6/2002) reports can be added. The Customer reports are existing customer reports or reports that TEC Associates can write specifically for the customer. Thus, any existing reports the customer is currently using can be implemented in the system; allowing user to generate these reports with various WHERE clauses. My Reports are for reports for a specific user within a customer.

Fraud and Abuse routines are identified from government sites and development is guided by a Nurse Managed Care expert. Additional routines will continue to be added over time. Health care reports include the financial/actuarial lag triangle, membership reports, and various distributions. Hedis reports support NCQA requirements by defined a fixed WHERE clause and fixed claim types; thus saving the user from this task and also protecting the user from any error. Most Hedis software providers generate Hedis reports as required on an annual basis. With The Smart Courier, Hedis reports are available throughout the year so that these measurements can be monitored on an ongoing basis. TEC Associates will be developing a Provider Profiling system which will focus on the non-institutional/professional providers initially. We have developed several Provider Profiling systems for various customers and know exactly what features are needed including: 1) the ability to independently identify

high/low providers based on utilization and cost as well as the ability to jointly rank providers based on utilization and cost simultaneously. 2) Ability to give credit for wellness type of procedures, 3) Ability to view high level ranking of providers using a single relative value. 4) Ability to view an individual provider on multiple levels including procedure, diagnosis, and claim detail.

Smart reports are included with The Smart Reporter for Healthcare, but these reports are actually industry independent. As TEC Associates moves The Smart Courier into other industries, the Smart reports will always be included. Smart reports allow the user complete control of output column selection and include graphic maps and plots, rank, summarization, and frequency distributions. Smart reports are a hybrid between predefined reports and creating a report from scratch. The interface for the Smart reports is very easy to use and include report simulation so that the user can see the report layout prior to running the actual report. This will result in a fewer number of runs, faster development, and actually as a training tool for the user.

Because these reports are provided in an interface with user defined WHERE clauses, they not only support high level analysis and reporting, but they can be used with an unlimited number of WHERE clauses for lower level analysis. For example, these reports can be generated by account, by provider specialty, by provider, etc for lower level analysis.

Report output includes a cover page that displays the WHERE clause used to generate the report. How often have you generated a report or had one handed to you and not know what data went into generating it? Although some WHERE type information is typically specified through titles and footnotes, it is often impossible to put an entire WHERE clause in titles and footnotes due to length or complexity of the WHERE clause. This cover page can be deactivated through the user interface.

Report output styles include MS Access, PDF, SAS, HTML, Excel, Word, Delimited, and Text. Multiple styles can be generated simultaneously.

USER INTERFACE

In addition to needing industry intelligence and complex technical capabilities, users desire an

interface that is easy to use, presents only valid options, and offers data protection to insure accurate results. Ease of use and capabilities are typically at opposite ends of the spectrum, but the additional of business intelligence, makes both possible. We have achieved all of the above!

The interface is easy to use; just point and click; top to bottom and left to right. It is so intuitive, to operate it, no training is required. Training will be provided as part of the installation and will focus more on business intelligence and data protection.

The pages following this writeup will present screen shots of the windows that comprise the user interface. But to summarize, we have tried to make the interface concise so there aren't many windows – 1) the password screen, 2) the main menu where the user selects the report, claim types, builds the WHERE clause, selects output styles, runs the report and opens the report, 3) subset windows for selected data values for a selected variable, 4) optional customize window accessed from the main menu to override default output criteria, and 5) Smart windows that allow the user to define Smart reports.

Internally, The Smart Courier is totally dynamic and table driven. All pick lists in the interface are actually SAS data sets tailored to the customer's environment and needs. Adding a new report is as simple as adding a row in a SAS data set.

TECHNICAL OVERVIEW

The Smart Courier is based on a Windows interface that can run on a single workstation or a Windows server. Windows server implementation will utilize products like Windows Terminal Server to produce access from workstations. SAS products required include Base SAS®, SAS/AF®, SAS/GRAPH®, SAS/FSP® and optionally SAS/Access to PC File Formats® (for MS Access output style).

The Smart Courier has a dynamic architecture and requires a custom installation to configure the software to the customers data structure, data warehouse software, and reporting needs. The custom installation includes: 1) set up access to customer claims, membership, provider, and decode tables; 2) set up parameters tables which control pick lists; and 3) adding existing customer reports to the interface. TEC Associates can design

and build a data warehouse or data mart to be used as the data source for The Smart Courier if that is the best approach. TEC Associates is also available to write new reports for The Smart Courier

FUTURE

Future development for The Smart Courier for Healthcare includes additional Fraud and Abuse routines, additional Healthcare reports, and Provider Profiling. If our customer base desires, a web deployment of the product will be made. Other capabilities to be added include: 1) saving/including WHERE clause, 2) interface to update the interface, 3) output style Drill for defining and building drill down analysis. In addition, The Smart Courier will be extended to other industries. As this document is dated 6/13/2002, it is anticipated that several of these capabilities will be complete by the time this paper is presented.

TEC ASSOCIATES STAFF

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This is the main menu. User has selected:

- report category, 'Customer'
- report, 'Account Profile'
- report claim types, 'Inst Inpat' and 'Inst Outpat'
- subset claim type, 'Inst Inpat' and 'Inst Outpat'
- subset variable, 'Diagnosis Primary' has already been selected as well as DRG; as reflected in the WHERE frame.
- output styles HTML and Word
- The report has already been run; as the output is shown in the Output Index frame.

Output from the above run is displayed by highlighting a line in the Output Index frame and clicking Deliver. This brings up the associates software, in this case Internet Explorer.

The HTML output is shown here. Note WHERE clause in cover page.

Claim Type	Diagnosis Primary	DRG	Claim Type	Diagnosis Primary
(claim_type='I'	and ('7201' <= DIAG_PRIMARY <= '9539')	and DRG in('500','499','498','497','009','004'))	or (claim_type='O'	and ('7201' <= DIAG_PRIMARY <= '9539')

Rank	Account	Subtotal	Total	Paid Amount
1	66666 - Campbell's Care	\$1,519,410.30	\$483,644.01	\$483,141.41
2	22222 - Debbie's Dance Studio	\$335,330.84	\$102,490.12	\$104,317.77
3	45454 - Time Pool Place	\$248,188.85	\$90,255.15	\$92,444.37
4	34343 - Rusty Dog N' Sade	\$238,905.25	\$78,719.58	\$80,917.71
5	67676 - Trinas Mexican Restaurant	\$199,963.03	\$73,446.91	\$73,495.54
6	77777 - Mathias Accounting Service	\$193,230.10	\$61,520.40	\$61,997.55
7	55555 - Jaffe Party Place	\$136,303.27	\$44,789.73	\$44,311.52
8	23232 - Brevette Postal Service	\$32,288.09	\$12,991.57	\$12,638.13
9	12345 - Abbye Art Studio	\$18,590.30	\$6,684.92	\$6,727.02
10	99999 - Dianne Antique Mall	\$19,630.41	\$5,780.89	\$3,731.39
11	89898 - Kirta Home Repair	\$20,711.74	\$4,667.95	\$5,223.03
12	78787 - Cheryl's Decorating Den	\$10,830.76	\$4,865.79	\$4,689.87