Texas Department of State Health Services

Trauma Registry Improvement System Assessment

Emergency Medical Services/Trauma Registry Systems Final Report

September 30, 2009

Report Executive Summary Only

I.   Executive Summary

I. Executive Summary

This section provides an executive summary of the activities, findings, and recommendations contained in the Emergency Medical Services (EMS)/Trauma Registry Systems Final Report.

A. Introduction

The Texas Department of State Health Services (DSHS) has embarked on an effort to assess its current Trauma Reporting, Analysis, and Collection in Texas (TRAC-IT) registry system. This effort, formally called the "Trauma Registry Improvement System Assessment (TRISA) Project," has stemmed from DSHS and stakeholder concerns over the integrity, usefulness, and viability of the current system.

The overall goal for the TRISA Project is to provide the best registry system for the State of Texas. High-level project objectives include the following:

- Improve stakeholder use and participation.

- Identify new and emerging alternatives for future solutions.

- Establish recommendations for a new statewide registry system that are supported by solid justification and rationale.

As part of the TRISA Project, DSHS engaged MTG Management Consultants, LLC, to provide professional and independent consulting services. During this engagement, MTG worked with the Division for Prevention and Preparedness Services, Injury and EMS/Trauma Registry Group, and their stakeholders to identify the business and technical drivers, processes, and intended outcomes to support recommendations for a new registry system.

The project included an assessment of the existing registry, evaluation of product trends and vendors, consideration of alternatives for future solutions, and the development of recommendations for a new statewide EMS trauma registry system. A summary of the TRISA Project activities, findings, and recommendations follows.

B. Current Registry Assessment

Since implementation of the TRAC-IT registry in 2002, its availability for use has been limited due to recurring stability, reliability, scalability, and performance issues. While many of the stability and reliability issues have now been addressed in the current system, scalability and performance continue to be problematic due to the flaws in the underlying data architecture.

Prior to July 2007, the TRAC-IT registry was found to have suffered significant performance deficiencies. These deficiencies, including significant downtime, non-working reporting

tools, and limited functionality to support user needs, have resulted in a tenuous relationship between the stakeholder groups and DSHS.

Since 2008, system maintenance records provided by DSHS show that availability has been limited only due to scheduled system maintenance, including 19.50 days of maintenance in 2008 (94.6 percent availability) and 16.92 days of maintenance thus far in 2009 (93.1 percent availability).   Over the last 6 to 8 months, the DSHS Application Development Group has worked to maintain and stabilize the registry application through a series of HW and SW improvements. They continue to resolve a number of small to medium defects, correct reports, and make small improvements to the functionality of the registry application.

Increasing the performance and scalability of the registry is still limited by the fact that the application is designed to process a single transaction at a time. Upgrading the application to support multiple transactions concurrently would require a complete redesign of the database and application code. There are no plans to completely redesign the application at this time.

EMS and hospital stakeholder participation records provided by DSHS show the number of stakeholder entities participating and submitting records to the TRAC-IT registry increased in the two years after its implementation in 2002, but has since consistently decreased. However, the number of records submitted to the registry has consistently grown since its implementation.

Although recent efforts have been made to improve TRAC-IT operations and performance, stakeholder frustration and dissatisfaction with the registry continues.

C.   Stakeholder Needs Assessment

An assessment of stakeholder needs was conducted to understand the specific needs and capture stakeholder requirements for a new registry. The assessment included 19 sessions conducted at 10 locations throughout Texas, and it involved over 200 individuals representing approximately 60 EMS services and 80 hospitals.

The table below reflects the top 10 major topics reported by the stakeholders. These findings represent the functionalities or enhancements that, if included in the new registry, would improve stakeholder participation. The value column represents the percentage of total stakeholder comments received in the survey that were related to the particular topic.

Table 1 – Stakeholder Survey Results

Rank	Finding Topic	Value	Needs – Comments/Description
1	Reports	21.1%	Variety of reporting tools; benchmarking at local/ regional/state level.
2	Ease of Submission	17.9%	Easy-to-use submission methods (local/Regional Advisory Council [RAC]); does not entail more work.
3	Management/Support	11.0%	Communications; training; purpose of registry; involvement.
4	Compatibility	7.9%	Acceptance of data from existing local systems; no new software (SW) to buy.
5	Data Accuracy/ Validity	7.6%	Elimination of duplicates and unused data; provision of error checks.
6	Reliability	7.4%	High availability.
7	Standards	4.8%	Industry standards (National Trauma Data Book [NTDB], National EMS Information System [NEMSIS], other).
8	Linkage	4.8%	EMS/hospital sharing of data submission, tracking of outcomes.
9	Technical Support/ Help Desk	3.9%	24×7 support; knowledgeable and understandable operators.
10	Analysis	3.4%	Capability to extract and analyze data.

The majority of the stakeholders expressed serious concerns with regard to the current registry performance as well as DSHS's ability to operate and maintain the system. Aside from the issues with system performance, many stakeholders feel that DSHS does not listen to them. Failed communications and support deficiencies are critical problems that were found to impact not only stakeholder relations but overall registry participation as well. During the stakeholder sessions, it became very obvious that the recent improvements by DSHS to improve TRAC-IT have done little to change stakeholder perception of the system.

D. Other States Review

MTG surveyed 49 states to qualify states that had desired registry characteristics consistent with the project goals and objectives for Texas. These characteristics included:

- Statewide EMS/trauma registry with a history of success.

- Mandatory submission.

- Proven commercial off-the-shelf (COTS) product.

- Registry that provides linkage between EMS and trauma data.

- State that has similar demographics to Texas (e.g., population, size, density, trauma volumes, rural versus urban areas).

- Registry system that is compliant with NEMSIS and NTDB data standards.

The results of the survey determined that Minnesota, Missouri, and Pennsylvania would be visited, and that formal interviews would be conducted in Nebraska, Alaska, North Carolina, and Mississippi. As a result of the visit and interviews, the project team gained useful information and best practices related to management and organization, registry data quality and validity, COTS systems evolution, registry systems attributes, systems acquisition, historical data migration, registry systems cost, and help desk support.
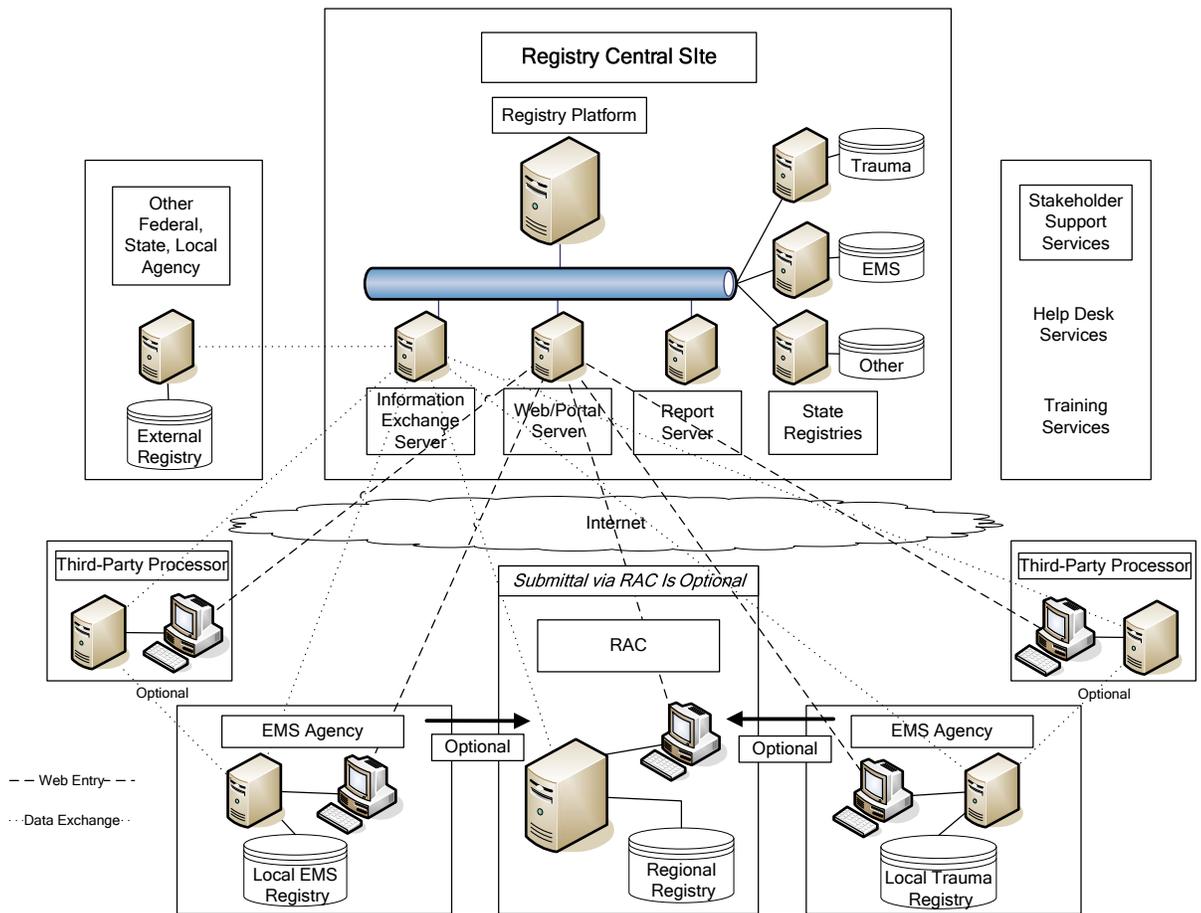
E.   Registry Component and Requirements

Conceptual registry solution components were identified based primarily on the team's assessment of the current registry, information gathered from the stakeholders, project meetings, and interviews with other states and product vendors. The logical and functional components defined are listed below and represent the basic building blocks for the new registry.

- Registry Platform
- State Registries (Trauma, EMS, Other)
- Report Server
- Web/portal Server
- Information Exchange Server

- Help Desk Services
- Training Services
- Local EMS Registry
- Local Trauma Registry
- Regional Registry
- External Registry

The conceptual model developed for the new registry to support these logical and functional solution components is illustrated below.

Figure 1 – New Registry Solution Components

In the ultimate design, multiple logical components will likely be implemented through common SW solutions and hosted on common physical hardware (HW) systems.

Functional and non-functional registry requirements were developed based primarily on the requirements identified and confirmed during the stakeholder needs assessment. However, as a result of MTG's research of other states' registry solutions, consideration of commercial products available, investigation of market trends, and basic industry best practices, additional requirements were identified to augment the stakeholder baseline. These combined requirements provide a comprehensive baseline for the future registry require-ments that meets the documented needs of the stakeholders as well as the goals and objectives established for the TRISA Project.

F.   Alternatives Analysis

The alternatives analysis was conducted at two levels. The first level included a high-level assessment of practical solution options identified without constraints of strategic direction or defined needs that may limit ideas. This initial assessment considered six major alternatives, along with optional implementation, acquisition, or operational approaches. To

guide the assessment of the high-level solution options developed for consideration, the following evaluation criteria were established:

Table 2 – Key Evaluation Criteria

Key Evaluation Criteria	Basis for Criteria
COTS Product	Stakeholders provided a clear message that they wanted a tested commercial product, not a custom-developed solution. Stakeholders apparently expressed their desire to obtain a COTS solution prior to TRAC-IT, but the decision was made to develop a custom solution. The history of poor performance related to TRAC-IT strengthens the stakeholders' argument.
Outsourced Solution	Outsourcing the registry operations to a third party is another stakeholder requirement. Stakeholders believe DSHS has demonstrated that it does not have the resources or capability to operate the registry.
Standards-Based	EMS and hospital stakeholders expressed the requirement for an industry standards-based solution. A common concern involved the need for a data dictionary based on the NEMSIS Gold and NTDB standards.
Proven and Reliable	Stakeholders noted reliability issues many times due to the lack of success with TRAC-IT.
EMS and Hospital Linkage	Linkage between EMS and hospital stakeholders is critical to reducing redundant data submittal, improving data accuracy, and enabling tracking of patient outcomes.
Local Registry Compatibility	Stakeholders and RACs should have the ability to use independent SW that seamlessly interfaces with DSHS's system. Smaller organizations should have the option to use the state system in place of a third-party vendor solution.

Using these criteria, the major alternatives and applicable approaches were evaluated and rated with respect to their compliance. The table below illustrates the results of this assessment.

Table 3 – High-Level Alternatives Analysis

Consideration	COTS Product	Outsourced Solution	Standards-Based	Proven and Reliable	Registry Linkage	Registry-Compatible
Build EMS and Trauma Solution						
– Develop In-House	N	N	Y	N	Y	Y
– Hire Third-Party Vendor to Develop	N	Y	Y	N	Y	Y
Buy Integrated COTS Solution						
– DSHS Purchases and Hosts System HW	Y	P	Y	P	Y	Y
– DSHS Purchases Solution, Outsources Operations	Y	Y	Y	Y	Y	Y
– DSHS Outsources Software as a Service (SaaS)	Y	Y	Y	Y	Y	Y
Buy "Best of Breed" COTS Solution						
– DSHS Purchases and Hosts System HW	Y	P	Y	P	Y	Y
– DSHS Purchases Solution, Outsources Operations	Y	Y	Y	P	Y	Y
– DSHS Outsources SaaS	Y	Y	Y	P	Y	Y
Transfer Existing Custom System						
– CDC's Registry Plus	N	P	P	Y	P	P
– Other States' Registries	N	P	P	Y	P	P
Incrementally Update TRAC-IT						
– Develop In-House	N	N	P	N	P	Y
– Contract With Vendor to Update TRAC-IT Components	N	N	P	N	P	Y
Do Nothing						
– Maintain TRAC-IT	N	N	N	N	N	Y

Rating Legend	
Yes	Y
Partial	P
No	N

The evaluation results show that the two alternatives associated with a COTS solution and outsourcing are clear leaders. As a result, the following two solution types were selected for detailed analysis:

- *Integrated EMS and Trauma COTS Solution* – In this case, a single vendor is selected to provide a solution that includes the trauma and EMS registries and all supporting components and services.

- *Best-of-Breed EMS and Trauma COTS Solution* – This solution includes the procurement of separate registries based on the best solution for the specific application, and a central host would integrate the applications.

Best-of-breed solutions may provide richer functionality, the cost savings, operational efficiencies, and improved data sharing can make the integrated EMS and trauma approach very appealing. Using a structured alternative evaluation model, a detailed analysis each alternative was performed. A summary of this analysis is presented in the table below.

Evaluation Category	Weight	Percentage of Total Weight	Alternative Evaluation Scores		
			Alternative 1 – Integrated EMS and Trauma Solution	Alternative 2 – Best-of-Breed Solution	Variance Between Alternatives
A. Desirable Business Operational Impact	30	12.50%	120	105	15
B. IT Operational Impact	30	12.50%	135	60	**75**
C. Technology Environment	30	12.50%	135	120	15
D. Time to Complete	30	12.50%	120	105	15
E. Functionality	30	12.50%	120	135	(15)
F. Cost	30	12.50%	105	90	15
G. Realized Benefits	30	12.50%	135	90	**45**
H. Project Resource Impact	30	12.50%	120	60	**60**
Total Score	**240**	*100.00%*	**990**	**765**	**225**

In addition to evaluating the leading alternatives based on their individual merit, MTG assessed different options for operations, acquisition, and procurement as outlined below.

- *Operations strategy*: Outsource or Traditional Operations.

- *Systems acquisition model*: Capital Purchase, Payment Plan or Software as a Service (SaaS).

- *Procurement approach*: Single or Multiple Procurements.

The assessment of these concepts resulted in key decisions that supported the overall recommendations for the future registry.

G.   Future State Registry Recommendations

MTG's recommendations are primarily based on the needs and requirements developed by the stakeholders, DSHS's direction, and goals and objectives of the TRISA Project.

Based on the evaluation criteria, the overall recommendation supports procurement of an integrated EMS and trauma solution. The detailed analysis found that both of these alternatives were viable solutions to support the requirements and offer significant benefits to DSHS and stakeholders. However, the integrated EMS and trauma COTS solution proved to be the preferred option based on the following:

- Reduced project complexity by virtue of administering one project for both EMS and trauma registries with a single vendor methodology and application framework.

- Increased system registry manageability with only one set of system tools for both registries. This results in fewer support staff, less training, and reduced technology investments/liabilities.

- Streamlined administration of registry operations, one procurement process, one relationship, and one contract agreement with a single vendor.

- Reduced cost by way of establishing and operating a single technical environment (e.g., one database suite as opposed to multiple database suites for two different registries) and reduced implementation and operations cost.

- Increased registry accountability, as DSHS can hold a single vendor accountable for both EMS and trauma registries. This is important because of the integration aspects of both registries. Integration of two different vendor systems would add another layer of complexity; complexity results in greater risk.

- Effective way to implement both EMS and trauma registries that meets DSHS and stakeholder needs in a relatively short amount of time.

Given the overall recommendation of an integrated EMS and trauma solution, the following recommendations for operation strategy, system acquisition model, and procurement approach were provided.

Key Decision	Recommendation	Comments
Operation Strategy	Outsource Operations	The outsourcing option minimizes DSHS's operational support footprint and leverages vendor expertise.
Systems Acquisition Model	Payment Plan	Given the outsource operation, setting up a payment plan to spread costs over time makes good financial sense.
Procurement Approach	Single Procurement	This approach will include an RFP for an integrated solution from a single prime vendor.

In addition to the recommendations based on the registry solution alternatives, project findings suggested a number of recommendations are appropriate related to the program management and coordination. The recommendations address the following topics:

- Program placement.

- State and stakeholder coordination.

- Change management.

- Communication and trust.

The theme of the management recommendations addressed above focuses on improving the working relationships between DSHS and the stakeholder groups. The current working relationships between DSHS and the stakeholders are tenuous at best. If appropriate steps are not taken to successfully improve relations and enable the groups to work together toward common goals and objectives, the performance of the registry will not matter.

H.   Recommended Next Steps

To support realization of the solution alternative and management recommendations, MTG suggests the following next steps:

- Establish a Diverse Executive Steering Committee.

- Establish a Registry Work Group.

- Perform Project Delivery Planning.

The first two steps suggested above are key in building working relationships to improve communications and understanding of stakeholder needs and issues. Working together on the project planning and decision making will promote mutual buy-in to the selected solution, active and participative problem solving, and recognition of future successes.