An Enterprise Information Integration (EII) Approach for a Syndromic Surveillance System

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OBJECTIVE

EII is the *virtual* consolidation of data from multiple systems into a unified, consistent and accurate representation. An analyst working in an EII environment can simultaneously view and analyze data from multiple data sources as if it were coming from one large local data warehouse. This paper posits that EII is a viable solution to implement a system covering large areas and disparate data sources for syndromic surveillance and discusses case studies from environments external to health.

BACKGROUND

There are three critical areas to address to build an effective syndromic surveillance system that is dynamic, organic and alert, capable of continuous growth, adaptability and vigilance: (1) timely collection of high quality data (2) timely integration and analysis of information (data in context) (3) applying innovative thinking and deriving deep insights from information analysis. In our view there is excessive emphasis on algorithms and applications to work on the collected data and insufficient emphasis placed on solving the integration challenges. This paper is focused primarily on our expertise with information integration.

METHODS

There are four major integration aspects to building a real-time surveillance system: (1) Semantic integration – developing rich definitions of syndromes based on domain knowledge and observations from the field to provide in-depth and innovative context (2) Information Integration – mapping semantics to relevant diverse, distributed data sources owned by different organizations (2) Application integration – adapt and share isolated and highly specialized applications across the community as services and finally (4) the critical enabler – Cultural integration – creating, sustaining and growing a consortium of data and application providers who appreciate and adopt integration.

The methodology shown here provides a promising solution to build a surveillance system through joint efforts of IT personnel and domain experts. Isolated applications that are tightly coupled to local databases can be converted into shared services based on Service Oriented Architectures easily discovered throughout the virtual "surveillance enterprise" and used by analysts in diverse locations to provide real time surveillance. EII encourages real-time localized data collection as it eliminates the burden of timely transmission to centralized locations. Local data sources are loosely connected to the federated data model so changes in data formats and database management systems have minimal impact on the federated data model. The federated data model is accessible to analysts from different organizations simultaneously to conduct specialized analysis.
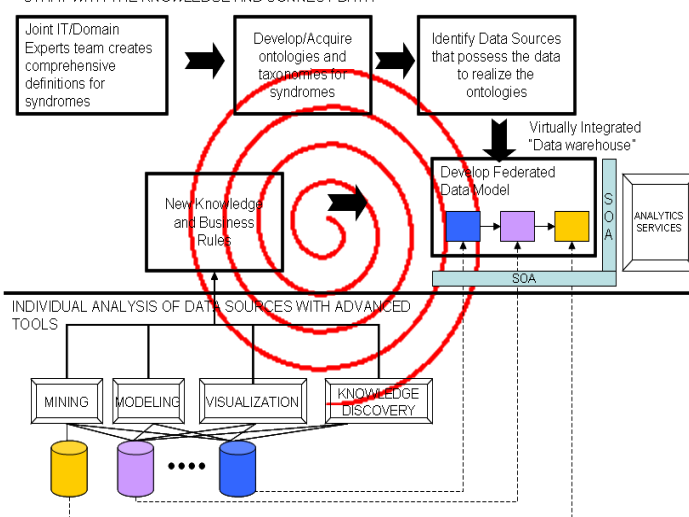
RESULTS

We have had successes and failures in our implementations; we will share them with the surveillance community.

CONCLUSIONS

Fundamental challenges to integration are cultural that in turn create process, organizational and technology challenges/ An EII based approach helps to address these challenges holistically.

REFERENCES

[1]. Integrating Information for the Enterprise, Booz Allen Hamilton Inc., 2004.

[2]. Content Management Best Practices, Booz Allen's presentation to the Intelligence Community, June 2003.

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