

## Emergint Data Collection and Transformation System (DCTS)

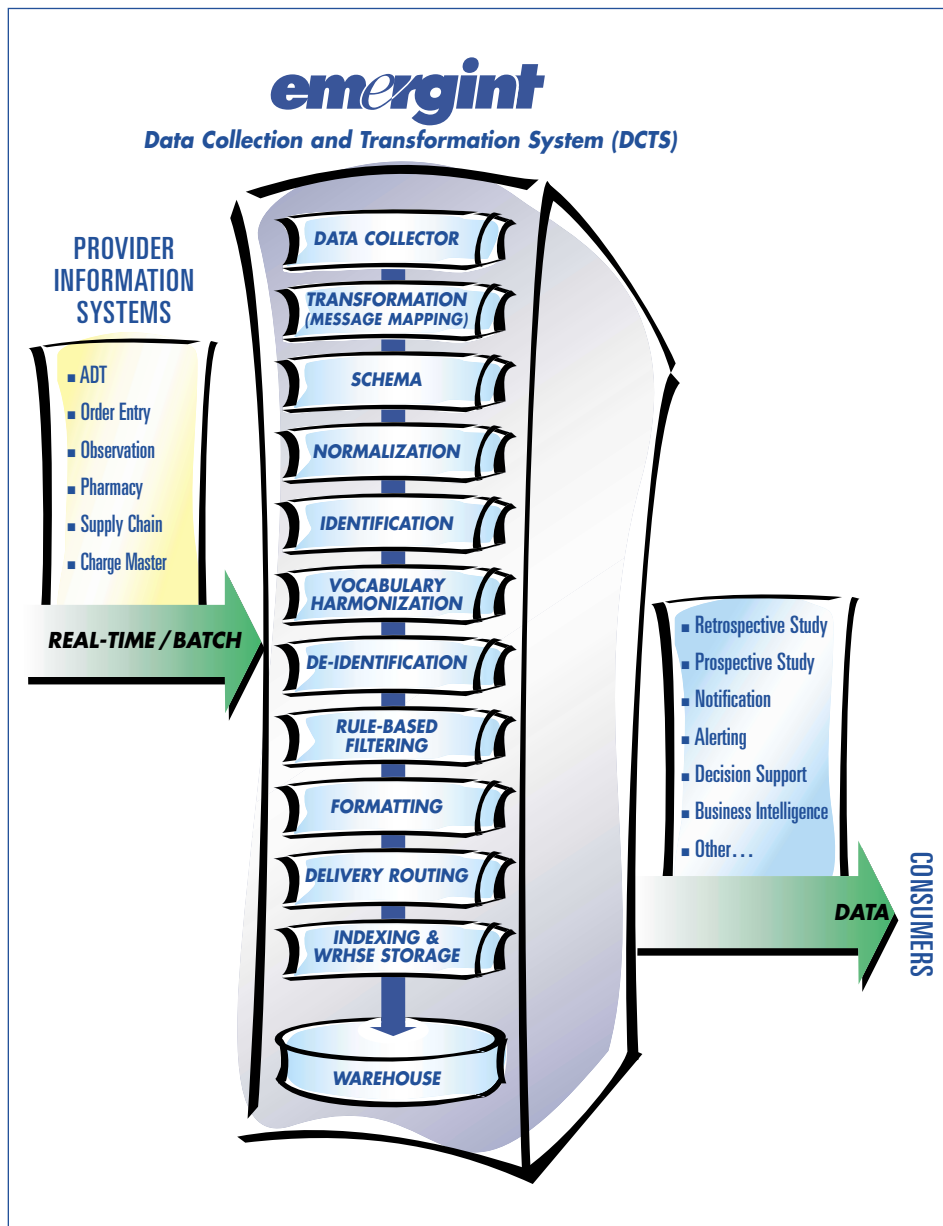
### EASILY MASSAGE DATA

Many out-of-the-box capabilities make DCTS an attractive platform for solutions that require common data preparation services. Services inherently available include patient matching/identification, HIPAA

scrubbing, business rule application, content filtering and surveillance, and terminology management and standardization. A loosely-coupled architecture allows additional data preparation services to be easily employed.

### DCTS SERVICES

- Transformation services can be rendered for native/custom formats, as well as industry standard formats, such as HL7, X12, NCPDP, NSF, etc.
- Schema services enable data validation, such as message structure verification, data type and value checking, and entity relationship checks.
- Identification services assign and validate globally unique identifiers and provides longitudinal linking utilizing simplistic and probabilistic matching.
- Vocabulary Harmonization offers terminology translation, such as diagnosis and syndrome binning and UMLS concept matching to allow for centralized downstream intelligence.
- De-Identification services are configurable for HIPAA De-Identified and Limited Data Set (LDS), or custom data scrubbing operations.
- Rule-based Filtering includes an SRML-compliant Rules Engine and Rules Management Portal that offers the ability to easily filter the data stream. The system already contains greater than 2,000 triggers for clinical and public health surveillance. Rules can be imported and exported for use with ancillary rules engines and management systems.
- Formatting data services are available to support many common public health and healthcare uses, as well as customization capabilities.
- Delivery Routing connects DCTS with its data consumers. Numerous industry standard protocols, such as PHIN MS, can be enabled to route DCTS output data. Routes are easily managed via web portal.



## Emergint Data Collection and Transformation System (DCTS)

Cost effective data collection and data preparation services for public health surveillance and notification, retrospective and prospective research, and early event detection and alerting.

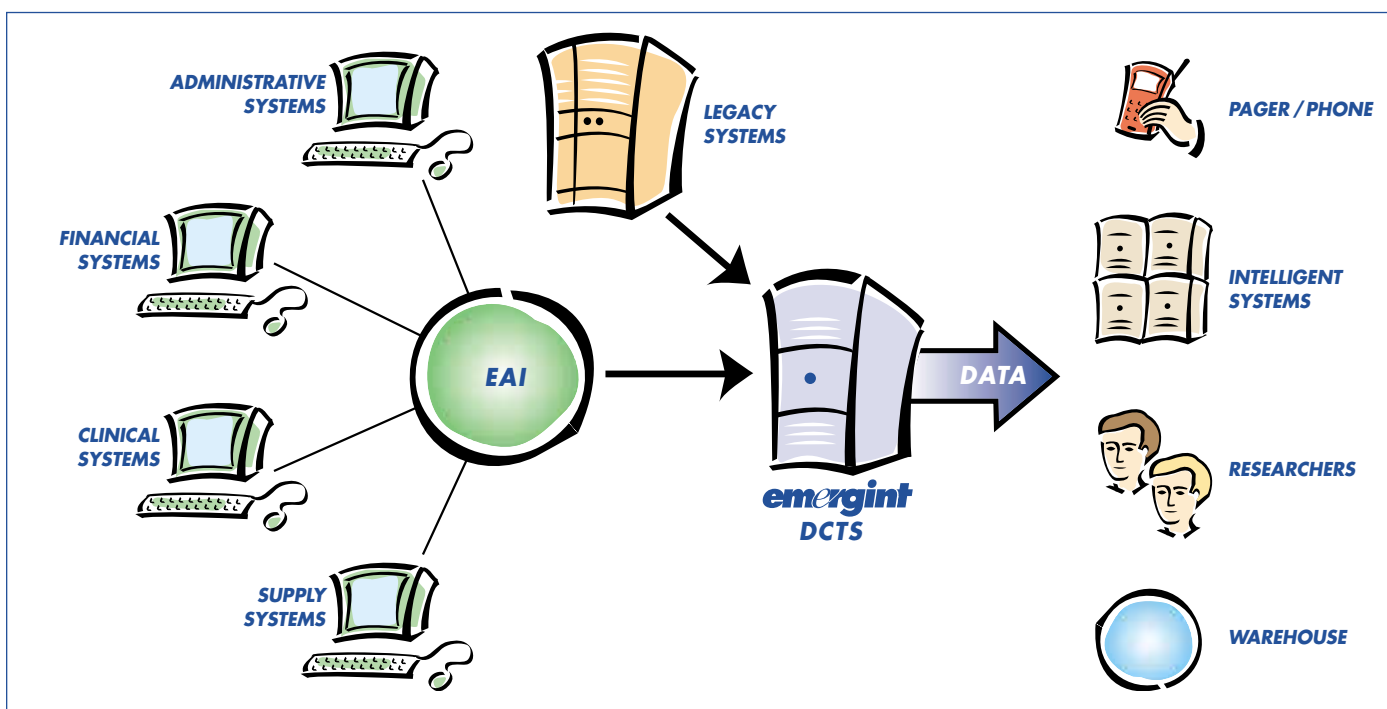
Emergint's DCTS is the data collection technology and services for CDC's BioSense Program. Additionally, CDC has licensed Emergint's DCTS for internal

programs relating directly to PHIN. DCTS is Emergint's flexible, highly scalable data collection technology for longitudinal matching, data normalization, vocabulary and code harmonization, as well as Public Health based rules filtering and messaging.

### NON-INVASIVE INTERFACING

The Emergint DCTS allows for seamless interfacing with Clinical

Care Provider and Public Health Information Systems. The extraction and integration technologies route and translate messages between software systems within a clinical environment in both real-time and non-real-time. DCTS includes many data validation and preparation services to make data consistent and available to data consumers.



### PROVEN PHIN TECHNOLOGY

DCTS technology and Emergint's implementation services currently support a myriad of CDC's PHIN solutions, as well as PHIN compliance solutions for other public health activities.

- BioSense
- PHIN MS
- NEDSS
- KY Health Event Network

### SUPPORTS PHIN FRAMEWORK

DCTS eases the technical challenges of implementing PHIN capabilities to assist public health officials execute on the PHIN Concept.

- Detection and Monitoring
- Analysis
- Alerting and Communications
- Information Resources and Knowledge Management
- Response



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## IT Consulting Services

Emergint provides health-related Data Collection and Processing, including implementation services for our Data Collection and Transformation System (DCTS) and Clinical Data Transformation Engine (CDTE). Emergint collects data from and for care providers, laboratories, research organizations, and Federal and State Health Departments around the U.S. Emergint provides the data aggregation for organizations that perform operational analysis, healthcare research and epidemiology. Emergint's expertise includes IT Services for Disease Surveillance, BioTerrorism Preparedness, Messaging and Notification, as well as Analysis and Visualization.

### IDENTIFICATION SERVICES

- ID and Clinical Data Separation
- Multi-Department and Facility Matching
- Probabilistic and Accurate Matching

### DE-IDENTIFICATION AND LIMITED DATA SETS

- HIPAA Compliant De-Identification
- HIPAA Compliant Limited Data Sets
- Generation and Validation of Unique Identifiers

### DATA NORMALIZATION

- Multi-Format Matching
- Transaction and Batch-fed Matching
- Proprietary HL7 - Segment Standardization
- Non-HL7 to HL7 Normalization

### HARMONIZATION

- Vocabulary Matching
- Proprietary Code and Non-Standard Code Leveling
- Semantic Networking and Concept-based IDs
- Syntax-based Integration
- Syndromic Binning

### DATA STORAGE AND RETRIEVAL

- Transaction Processing and Storage
- Object-based Storage and Retrieval
- Object-Relational S&R

### MESSAGING

- PHIN and NEDSS Compliant
- Multi-target User Defined Notification

### DATA ANALYSIS

- Cohort Design and Validation
- Statistical Analysis
- Syndromic Surveillance
- Multi and Relational On-line Analytical Processing

### VISUALIZATION

- Geographical Information Systems
- Multi-Dimensional Graphing

## CASE STUDIES

### *BioTerror Preparedness and Disease Surveillance – Federal*

#### **CDC BioSense Program**

The CDC's BioSense Program collects data from numerous national sources for the purpose of disease specific and syndromic surveillance. BioSense currently collects data from national and federal sources, while future phases will collect broader data types from regional and local sources for rapid incident detection and response. CDC literature states that it will "improve early detection through the implementation of near real time reporting of health data". Emergint technology provides the backbone for this effort.

The DCTS provides a unique and light-weight capability for BioSense to interface with hospital information systems, making it the enabling technology of choice for the CDC's dedication to "the implementation of enhanced connections between clinical care and public health". Emergint has licensed the DCTS to CDC for use in this nationally known BioSense program. Additionally Emergint provides the data collection, normalization, harmonization and Syndromic Binning expertise and services to design and develop interfaces and systems used to collect and prepare data received from participating data providers. Emergint delivers the Normalized data to BioSense Data Stores for analysis and monitoring.

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## CASE STUDIES *(continued)*

### **BioTerror Preparedness and Disease Surveillance – State**

#### **Pilot Project for the KY Health Event Network**

The KHEN is setup very much like BioSense but across the Commonwealth and within community settings; that is to collect disparate data from local sources with the purpose of marrying the data for disease specific and syndromic surveillance. Emergint will provide the DCTS along with the CDTE Rules Engine, implementation, data normalization and messaging services to the Louisville Community for data collection and normalization from the local hospitals, EDs, out-patient clinics and Labs. Additionally Emergint will feed the processed data to the NEDSS compliant Electronic Public Health Record in use in Kentucky.

### **Data Visualization – Federal**

#### **CDC National Center for Environmental Health – SEEM Program**

The Spatial Epidemiology and Emergency Management system (SEEM) is a web-based tool developed by Emergint for NCEH/ATSDR staff to perform rapid mapping, overlay analysis, and visualization. SEEM is a tool that can be used by emergency responders at NCEH/ATSDR and a tool that can be used by epidemiologists, scientists, and researchers alike. SEEM is being developed in 3 phases to ensure timely availability of the application. Phase I, already delivered by Emergint, is the mapping and overlay analysis release. Phase II will add temporal analysis capabilities and Phase III

will add modeling capabilities. SEEM integrates ESRI's ArcIMS, ArcSDE and the NCEH/ATSDR spatial repository in ways unseen before. SEEM relies on a spectrum of technologies including Microsoft's ASP.NET, VB.NET, C#, ArcXML, Web Services, Java Servlets, DHTML, JavaScript, XML and XSLT, and MS SQL Server. Furthermore, SEEM's design and architecture takes into consideration CDC standards, including PHIN.

### **Data Aggregation and Warehousing Services – Commercial**

#### **Ascension Healthcare – Enterprise Data Management**

Ascension's EDM program is designed to improve their business intelligence and care delivery, as well as reporting needs by marrying the many, disparate data types from across their ministries (over 60 independently operating hospitals) and running multiple analytics against the harmonized data. Emergint licenses the DCTS as well as provides the implementation and data normalization services. Emergint receives and processes Ascension's transactional-based clinical data, batch-based financial data, as well as preprocessed financial data from third party analytic organizations to create a uniform and consistent data set with optimal utility.

### **Data Intelligence – Commercial**

#### **Computer Sciences Corporation (CSC) – Clinical Knowledge Exchange**

CSC developed the Clinical Knowledge Exchange (CKE) to improve the way and means by which care providers and life sciences organizations work with health data. CKE applies analytics to the married clinical and financial data from disparate hospitals and care providers across the country to provide a nationally and statistically accurate view into healthcare operations and treatments. Emergint licenses the DCTS and CDTE as well as performs the data collection, integration, normalization and harmonization services and processes which are the foundation of the CKE offerings.

Emergint also provides a broad range of IT services including: Project Management and Planning, Requirements Analysis, Systems Design and Architecture, Application Development using advanced technologies, Systems Customization and Implementation, Systems Support, Help Desk and Maintenance.



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