CALIFORNIA DEPARTMENT OF
Mental Health

California Behavioral Health Electronic Health Record (CA BH-EHR) Request for Information

September 17, 2008

Version 1.0

CALIFORNIA DEPARTMENT OF MENTAL HEALTH
Information Technology Division

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A. Preface

Introduction to this Request for Information (RFI)

The passage of Proposition 63, the Mental Health Services Act (MHSA) in November 2004, provided resources to support the delivery of mental health services by California's 58 county mental health programs and to monitor their progress toward statewide goals for mental health care in California. The MHSA provided funding for the infrastructure, technology and training elements that support a county's ability to address a broad spectrum of prevention, early intervention and service needs for children, transition age youth, adults, older adults and families. Improvement in client outcomes is a fundamental expectation throughout the MHSA implementation process.

Under MHSA, each county must develop Technological Needs Project Proposals that address the development of a long-term infrastructure that will facilitate the cost-effective delivery of the highest quality services and supports for consumer and family wellness, recovery and resiliency. Each county is responsible for its own budget and for tailoring its project proposals to meet the needs of the clients in that community.

DMH Technology Goals

All County MHSA Technological Needs Project Proposals must be framed within the context of the guiding principles of MHSA. The specific technology goals are to:

- Increase **CONSUMER AND FAMILY EMPOWERMENT** by providing the tools for secure consumer and family access to health information within a wide variety of public and private settings.

- M**ODERNIZE AND TRANSFORM** clinical and administrative information systems to improve quality of care, operational efficiency and cost effectiveness.

To facilitate the improvement of behavioral health services in the state of California, the Department of Mental Health (DMH), in collaboration with the County Mental Health Programs, contract providers, and the client, family and vendor communities, has assembled the requirements for an Electronic Health Record (EHR) System that would be a '*secure, real-time, point-of-care, client-centric information resource for service providers*' and would allow for the exchange of client information according to a standards-based model of interoperability.

DMH recognizes that the development of standards is an ongoing process that often reflects competing interests and, that standards are often more developed in some areas than in others. DMH wishes to facilitate the process whereby vendors adapt their systems to adhere to the standards that best serve the needs of California's behavioral health care recipients.

The purpose of this RFI is to share business and functional requirements with vendors and to obtain information about each vendor's ability to deliver standards-based and interoperable behavioral health information systems in California. This RFI will assist in obtaining information from vendors to be shared with the County Mental Health Programs with the intent to aid County/Vendor compliance with requirements. DMH is <u>not</u> building a single statewide system.

Business Requirements

The following business requirements, derived from Enclosure 3 of the *MHSA Capital Facilities and Technological Needs Proposed Guidelines,* reflect the State's desire that 'secure, real-time, point-of-care, client-centric information' be available in an interoperable environment.

To meet the Consumer and Family Empowerment Requirements the system should:
Provide accurate and current information about a consumer's mental health history to the service provider, the consumer and their family, when appropriate.
Promote client and family awareness and empowerment by emphasizing education and preventative care, and by providing an interface for exchanging data with a Personal Health Record (PHR).
Ensure access to mental health information that enables consumers to be informed and make sensible choices within the mental health system.
Promote informed, collaborative decision-making processes for clients, families, and clinicians.
Assist service providers with recording and monitoring the client needs and provide a means of reporting the utilized treatments that can be linked to the ongoing improvement of service quality and recovery.
Securely provide consumers with the ability to view and enter comments or data in their records, and the ability to share their journey with a designated family member, friend, and service provider.
Provide complete and accurate health information that is crucial in reducing medical errors and improving care coordination such as medication history, lab results, and other clinical information.

To meet the Modernization and Transformation Requirements the system should:
Provide the ability to review treatment and recovery information in a standardized format in order to develop decision support tools for improved client treatment by enabling the measurement of quality indicators as determined by national, state and county standards.
Decrease time in common administrative procedures and efficient communications with clients, family, and service providers.
Provide for integrated outcomes measurements that assess services and determine their cost-effectiveness.
Enable a collaborative decision-making process with service providers, consumers, and families in all aspects of the mental health system.
Automate core business functions – billing/claiming, assessments, workflow processes, etc.

To meet the Modernization and Transformation Requirements the system should:
Aid decision-making by providing access to health record information where and when they need it and by incorporating evidence-based decision support.
Provide clinicians with secure, real-time access to accurate, client-centric, clinical information that is communicable through interoperable behavioral and medical health systems using standards developed by Standards Developing Organizations (SDOs), such as the Certification Commission for Healthcare Information Technology (CCHIT) and Health Level Seven (HL7).
Allow different County systems to share information across a secure network environment both inside and outside their respective counties. Counties and their contract providers, hospital emergency departments, laboratories, pharmacies, and consumers and their families could all securely access information.

Functional Requirement Categories

The functional requirements that support these business requirements were developed by workgroups comprised of representatives from DMH, the County Mental Health Programs, and the client, provider, and vendor communities. These workgroups combined established Ambulatory, Interoperability and Security functional requirements from CCHIT with requirements that are specific to the delivery of behavioral health services in California to develop a set of functional requirements that are grouped into the following categories:

1. **Infrastructure Function Requirements**
   Includes hardware and software with basic level of security and systems ready to deploy software. Interoperable EHRs require a structure for sharing information—a secure network.

2. **Practice Management Function Requirements**
   Includes registration, eligibility, accounts receivable, accounts payable, billing, documentation, and reporting these requirements. Addresses the complex financial and administrative needs of physician practices. These requirements will help County Mental Health Departments formulate the criteria needed to provide critical support for practice management functions to increase productivity, improve financial performance, financial management and compliance programs, and determine legal implications of business arrangements.

3. **Clinical Data Function Requirements**
   Includes clinical documentation such as assessment, treatment notes, and other clinical measures (such as data elements and corresponding definitions) that can be used in the measurement of patient clinical management and outcomes, and for research and assessment. Clinical documentation elements also help facilitate communication across provider types to enhance communication and improve coordination of care.

4. **Computerized Provider Order Entry (CPOE) Function Requirements**
   Includes internal and external laboratory, pharmacy and/or radiology ordering and history display. These requirements address optimizing physician ordering of medications, laboratory tests with interactive decision support systems. Integration with other hospital information technology systems including electronic patient records, pharmacy, laboratory, and other services provides the prescriber with all information necessary to develop and transmit in an effective, error-free order.

5. **Full Electronic Health Record (EHR) Requirements**
   Includes infrastructure, health record capture, decision support, reporting, data transfer and CPOE components that are interoperable with external systems such as those used by contracted providers using industry standards.

6. **Full EHR and Personal Health Record (PHR) Requirements**
   Includes full EHR functionality and interoperability with a Personal Health Record system.

B. Statement of Intent

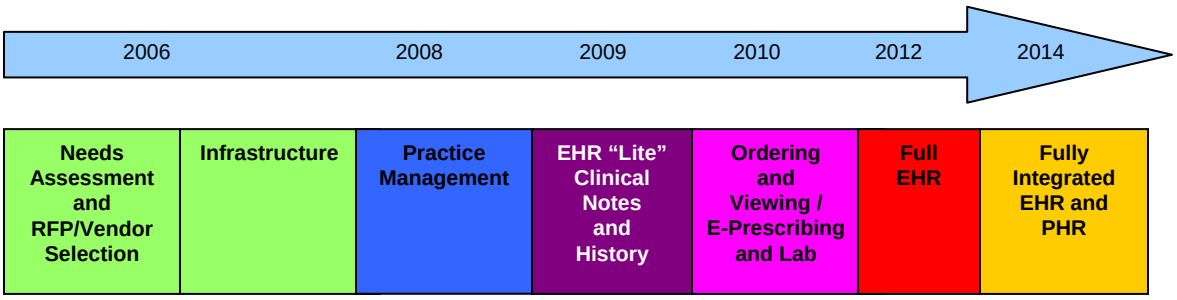
In an effort to provide the counties with a comparison of the different products on the market, the CA Department of Mental Health, is releasing this RFI to vendors. The results of this RFI will be shared with the 58 California Counties as they embark on choosing the vendor(s) and product(s) that will meet their individual county needs and align them with the statewide objectives for Electronic Health Record implementation and interoperability.

The intent of this RFI is to provide a mechanism for County Mental Health Programs to:

1. Evaluate the current vendor offerings available to them.
2. Assess the vendors' capabilities in a common platform of comparison.
3. Determine the vendors' ability to work in partnership to achieve the long term goals of interoperability with a variety of electronic health records and personal health record configurations as described in the DMH Integrated Information System Roadmap (Below).

DMH encourages any interested vendor to respond even though that vendor's solution may not be designed to address all of the Functional Requirement Categories identified by this RFI.

DMH Integrated Information System Roadmap



C. Responding to this RFI

Response Format

In order to aid in the consistency of responses received, vendors are requested to:

1. Submit your responses in Word format using 11 point Arial font.
2. Submit your response in a version of MS-Office no older than version2000.
3. Ensure that typed answers are provided to all questions. If any specific question or item does not apply to your response, please indicate so by answering 'N/A' for Not Applicable.
4. Respond to each of the requirements in the CA BH-EHR Functional Requirements Survey (an Excel spreadsheet) that accompanies this RFI document. The Functional Requirements Survey is an essential part of this RFI and must be completed and returned with this RFI document. See Section I in this document for more information about how to complete the Functional Requirements Survey. Vendors are encouraged to respond even if their solution does not address all of the functional categories identified in the RFI. Please be sure to respond to all of the requirements in the RFI. A response of "Not applicable" or "Not addressed" is acceptable when appropriate.
5. In each of the remaining sections of this RFI, a numbered indicator is used to identify a "Required Response". The format of this indicator is "**RR-x-nn**" where "x" is the section letter and "nn" is the number of the question in that section. For example the 1st question in Section D is labeled "RR-D-01".
6. Use Appendix A to append company or product literature to support, but not replace, an answer. **Please ensure that each enclosure within Appendix A contains a reference to the question or requirement for which the additional information is being provided**. Vendors are encouraged to use as much space as necessary to provide answers to all questions.

Response Delivery

This document and the CA BH-EHR Functional Requirements Survey must be submitted in electronic format no later than 5:00 p.m., PST, **11/11/2008.** Please E-mail your response to: **MHSA-IT@dmh.ca.gov.**

Be sure to append **your company's name** to the end of each file's name to distinguish it from all other responses. For example, if your company name is **ABC Company**, then prior to submission rename your files to:

1. CA BH-EHR RFI **for ABC Company**.doc and
2. CA BH-EHR Functional Requirements Survey **for ABC Company**.xls

If you wish to mail any supplemental information in hard copy it must be postmarked no later than **11/11/2008** and send to:

California Department of Mental Health
Information Technology
Attention: MHSA-IT
1600 9th Street, Room 141
Sacramento, CA 95814

D. Company Background

RR-D-01 Please provide the following information regarding the makeup of your company.

CORPORATE INFORMATION	
COMPANY NAME	InterComponentWare Inc. (ICW)
COMPANY TYPE (C-CORP, S-CORP, LLC, LLP, SOLE PROPRIETORSHIP, ETC.)	**C-CORP**
LOCATION OF CORPORATE HEADQUARTERS	InterComponentWare Inc. Headquarters Wayne 650 East Swedesford Road, Suite 180 Wayne, PA 19087 ICW Inc. Parent company is InterComponentWare AG, Headquarters Walldorf Industriestraße 41 69190 Walldorf, Germany
LOCATION OF FIELD SUPPORT OFFICES	Wayne, PA and San Mateo, CA
LOCATION OF PROGRAMMING/TECHNICAL SUPPORT PERSONNEL	ICW Technology Lab and West Coast office One Waters Park Drive, Suite 280 San Mateo, CA 94403
PRIMARY CONTACT INFORMATION FOR THIS RFI	
NAME	**FERTISS OVERTON**
TITLE	**VP OF SALES**
OFFICE/LOCATION ADDRESS	One Waters Park Drive, Suite 280 San Mateo, CA 94403
PHONE NUMBER	**310-428-8851**
E-MAIL ADDRESS	**FERTISS.OVERTON@ICW-GLOBAL.COM**
INTERNET HOME PAGE	**WWW.ICW-GLOBAL.COM**

RR-D-02 Provide an overview of your firm and its history. Describe the strength of your firm and its ability to meet the needs of California's behavioral health recipients and providers. **(2 pages maximum)**

InterComponentWare (ICW), founded in Walldorf, Germany in 1998, is a leading international eHealth specialist with offices in Germany, Bulgaria, Austria, Switzerland and the United States. Over 600 highly qualified specialists focus exclusively on the development of healthcare data information exchange platforms and solutions focused on connecting physicians, hospitals, payers and patients through tools that enable the streamlined, secure sharing of information.

ICW solutions provide connectivity using existing standards and existing information systems. Our solutions help organizations to achieve interoperability today while establishing a foundation to facilitate future adaptability and integration of additional systems and platforms.

ICW is committed to cooperating with providers and vendors to deliver interoperable health information systems across connected healthcare communities. Our suite of integrated offerings incorporates a standards-based architecture that reduces the costs of application integration and implementation.

ICW is an advocate of open source software and collaborative development. In this same spirit, ICW has assembled an advisory board comprised of visionaries and leaders in the U.S. healthcare market. This team of exceptional professionals provides valuable insight and guidance to ICW's strategic planning process.

InterComponentWare Inc.

Leadership

Jeremy P. Coote, CEO

US Advisory Board

Board Chair

Dr. David Nash, Chairman, Department of Health Policy, Thomas Jefferson University

Board Members

Dr. David Ahern, National Program Director, Brigham and Women's Hospital

Dr. Richard Baron, President, Greenhouse Internists, PC

Ms. Elizabeth Browning, Founder and CEO, LLuminari

Dr. Clair Callan, CEO, Callan Consulting

Dr. Raymond Fabius, President and CMO, I-Trax, Inc.

Dr. William Jessee, President and CEO, Medical Group Management Association

Ms. Janet Marchibroda, CEO, e-Health Initiative

Mr. David Merritt, Project Director, Center for Health Transformation

Dr. Blackford Middleton, Corporate Director, Partners Health Care System

Mr. Peter Miller, Co-founder, President and CEO, Take Care Health Systems

Dr. David Spratt, Vice President, Medical Administration, CROWN Cork & Seal USA, Inc.

Memberships

eHealth Initiative (eHI)

National Alliance for Healthcare IT (NAHIT)

Healthcare Information Management Systems Society (HIMSS)

America's Health Insurance Plans (AHIP)

Continua Health Alliance (CONTINUA)

Markle Foundation (MARKLE)

Health Level Seven (HL7)

Center for Health Transformation

Real-world experience

As a Germany-based company, we've deployed our know-how and products to solve many data interchange challenges throughout Europe. Because Europe has a very different healthcare environment, with government and large-scale consortiums often involved with large-scale, long-term technology implementations, many of our projects have been done through partnerships with other providers. In these partnerships ICW often plays the role of interoperability expert.

Below are a few examples of our experience providing the guidance and technology for a few large-scale projects:

German Federal Ministry of Health (BMGS) – The BMGS enlisted the help of a number of IT organizations—among them, IBM and SAP—for a project known as "better IT for better health", or bIT4health, to network the German healthcare system. ICW was tasked with the architecture of the connection points of the solution. This included the electronic exchange of information between EDP systems in medical practices, pharmacies, health insurance providers and regional health information organizations. This project is still in the design phase.

Bulgarian National Health Card project – ICW is currently building the e-health infrastructure for the country of Bulgaria. The initial phase of this 3-year project includes the implementation of an electronic health portal and personal health record for the 40,000 employees of the State administration. Other phases include the implementation of a national eHealth card and the rollout of LifeSensor PHR to every Bulgarian citizen.

German GP Association – In 2007, ICW provided the integration layer of our product Professional Exchange Server to connect 50,000 general practice physicians to a GP online network. The network improves the process and profitability of sign-up models, agreements on GP-centered care and integrated care contracts. The new network is not only open to GPs but to all healthcare providers for the exchange of medical information.

RR-D-03 List the number of employees (Full-time equivalents) in your organization by category for the last 3 years:

Category	2006	2007	2008
Total Employees	705	751	839
Installation / Setup	73	77	88
Research and Development	294	310	332
Application / Technology Support	104	113	142
Customer Service / Helpdesk Support	89	91	103
Other	155	160	194
Those with Clinical Backgrounds:	65	65	72
– **Physicians**	62	62	65
– **Psychologists**	0	0	1
– **Psychiatrists**	0	0	1
– **Registered Nurses**	2	2	5
– **Other Clinicians**	1	1	0

RR-D-04 Has your company acquired or merged with any other organizations in the past three years? No If so, please list each organization and the purpose behind such activity.

No, ICW has not acquired or merged with any other organizations in the past three years. ICW is a privately owned and financed company that has never had any acquisitions or mergers in its history.

RR-D-05 How long has your company been in the business of developing and implementing your Electronic Health Record related products?

For ten years. ICW was founded in 1998 in Walldorf, Germany. It has been in the business of developing and implementing Electronic Health Record-related products since its founding.

RR-D-06 What were your firm's annual revenues for the last 3 fiscal years?

ICW is a privately held company based in Germany. The company policy as dictated by our shareholders is not to provide revenue figures. If you have specific questions about the company's financial state, please do not hesitate to contact us directly.

Category	2005	2006	2007
$1,000,000 to $5,000,000			
$5,000,000 to $25,000,000			
$25,000,000 to $100,000,000			
Greater than $100,000,000			

RR-D-07 What percentage of your firm's annual revenue directly resulted from behavioral health care solutions during the past 3 fiscal years?

ICW provides solutions to a wide range of healthcare institutions. Many of these institutions provide behavioral health services, but it is unknown what percentage of revenue would be derived from these entities.

Category	2005	2006	2007
Percentage of Annual Revenue Resulting from BH Solutions	n/a	n/a	n/a

RR-D-08 What percentage of annual revenue did your company expend for research and development (R&D) on your proposed products during the last 3 fiscal years?

Please refer to our answer to RR-D-06.

Category	2005	2006	2007
Percentage of Annual Revenue Expended on R&D			

RR-D-09 What percentage is budgeted for R&D in the current and next fiscal year?

Please refer to our answer to RR-D-06.

Category	2008	2009
Percentage of Annual Revenue Budgeted for R&D		

E. Partner and/or Reseller References

RR-E-01 Please list any partners and/or resellers in the areas of behavioral health: Strategic or tactical development, sales, support, delivery, consulting, or training.

Lumetra

RR-E-02 For each partner or reseller listed above, please identify the following:

1. Functional areas.
2. Nature of partnership/relationship.
3. Length of the relationship.
4. Referencable customers for whom you have jointly provided services.

(3 pages maximum)

Lumetra is an independent, non-profit organization based in California, dedicated to improving the quality, safety, efficiency, and integrity of the state's healthcare systems through the adoption and use of technology.

With 24 years of experience in California, we have an intimate understanding of the complex issues facing providers, patients and their families, health plans, healthcare systems, and government entities. We leverage our relationships across the industry to deliver value to individual clients, customizing solutions for quality improvement and cost reduction in health information technology, clinical redesign, patient safety optimization, and program monitoring and evaluation.

Committed to delivering innovative solutions, Lumetra collaborates with its clients to help them realize their visions for care delivery. Our clients include several California state agencies, healthcare providers across the state, the federal Department of Veterans Affairs, the Department of Defense, and the Centers for Medicare and Medicaid Services.

1. Functional areas.

   - EHR / PHR and practice management consultation
   - EHR / PHR and Practice Management System (PMS) implementation
   - Clinician adoption strategies
   - Operational and quality improvement initiatives
   - Change management

2. Nature of partnership/relationship.

ICW and Lumetra have formed a strategic partnership to offer their complementary services to organizations such so California county Mental Health Departments.

Length of the relationship

2 years

3. Referenceable customers for whom you have jointly provided services.

References will be made available upon request for specific projects.

F. Behavioral Health Solutions Experience

Descriptions of the Functional Requirement Categories referenced in questions RR-F-01 through RR-F-05 of this section are in The Preface (Section A). In your responses to the questions in this section, emphasize your experience in the State of California.

RR-F-01 Describe your firm's experience and qualifications in design, development, and implementation of Behavioral Health Practice Management systems.
(5 pages maximum)

N/A

RR-F-02 Describe your firm's experience and qualifications in design, development, and implementation of Behavioral Health Clinical Data Management systems.
(5 pages maximum)

N/A

RR-F-03 Describe your firm's experience and qualifications in design, development, and implementation of Computerized Provider Order Entry (CPOE) systems.
(5 pages maximum)

N/A

RR-F-04 Describe your firm's experience and qualifications in design, development, and implementation of interoperable Electronic Health Record (EHR) systems. **(5 pages maximum)**

InterComponentWare (ICW) is an integration technology provider focused only on healthcare. We develop the applications—Electronic Health Record systems—to integrate disparate data sources using standard communication protocols, open development principles and a flexible, web-based architecture.

ICW and its partners recognize the unique needs facing California county Mental Health Departments in adopting EHR and allied systems. The Mental Health Services Act (MHSA) presents a remarkable opportunity for counties to modernize and transform clinical and administrative information systems to increase consumer and family empowerment, improve quality of care, and reach greater operational efficiency and cost effectiveness. We will work closely with you to assess your current environment and design IT solutions that advance you through the DMH Integrated Information System Roadmap as effectively as possible.

ICW's development of EHR solutions grew from our understanding of the challenges and weaknesses at the intersection of healthcare and information technology. From our inception in 1998, ICW has only been a healthcare technology company. We recognized that integration through standards and open development principles is critical to improving communication between healthcare providers and ultimately improving the quality of patient care. Through our patient-focused philosophy, we've developed products to solve these challenges.

Our EHR, known as Professional Exchange Server (PXS), effectively networks different healthcare sectors to improve quality and efficiency in patient care through:

- Increased transparency in patient care
- Intersectoral communication during and after care
- Online data exchange and access
- Remote monitoring for chronic diseases
- Synchronous online communication: online appointments
- Cooperation in disease management programs
- Improved harmonization in therapy

However, our products do not define ICW; they are simply the end result of our approach to solving the challenges of healthcare and IT integration. As a leading proponent of the open standards-based exchange of medical information, along with Agfa and Sun Microsystems, ICW founded the Open eHealth Foundation to help advance the cause of establishing a standard and interoperable healthcare information architecture.

Real-world experience

As a Germany-based company, we've deployed our know-how and products to solve many data interchange challenges throughout Europe. Because Europe has a very different healthcare environment, with government and large consortiums often involved with grand, long-term technology implementations, many of our projects have been done through partnerships with other providers. In these partnerships ICW often plays the role of interoperability expert.

Below are a few examples of our experience providing the guidance and technology for a few large-scale projects:

German Federal Ministry of Health (BMGS) – The BMGS enlisted the help of a number of IT organizations—among them, IBM and SAP—for a project known as "better IT for better health", or bIT4health, to network the German healthcare system. ICW was tasked with the architecture of the connection points of the solution. This included the electronic exchange of information between EDP systems in medical practices, pharmacies, health insurance providers and regional health information organizations. This project is still in the design phase.

Bulgarian National Health Card project – ICW is currently building the e-health infrastructure for the country of Bulgaria. The initial phase of this 3-year project includes the implementation of an electronic health portal and personal health record for the 40,000 employees of the State administration. Other phases include the implementation of a national eHealth card and the rollout of LifeSensor PHR to every Bulgarian citizen.

German GP Association – In 2007, ICW provided the integration layer of our product Professional Exchange Server to connect 50,000 general practice physicians to a GP online network. The network improves the process and profitability of sign-up models, agreements on GP-centered care and integrated care contracts. The new network is not only open to GPs but to all healthcare providers for the exchange of medical information.

But not all of our projects are of comparable scope. We have also helped some regional groups—of comparable size to a California county—establish healthcare networks.

Regional eHealth Network of Walldorf, Germany – ICW provided interoperability solutions deploying Professional Suite (our EHR suite) to providers, practitioners, pharmacies and, via LifeSensor (our PHR), patients throughout the Walldorf region.

Regional Health Initiative of Rhein-Neckar, Germany – This project was an extension of our work in the Walldorf region. We expanded the interconnected region to include Heidelberg and Mannheim. The project included connecting 1,200 physicians, 250 pharmacies, 71 hospitals and 2.3 million citizens. Later, we deployed another instance of Professional Suite to connect Heidelberg University Hospital with the health centers of Rhein-Neckar.

Bavarian Patient-Partner Association (PPV) – In 2005, through partnership with health insurer AOK Bavaria and the PPV, ICW developed and deployed a network utilizing PXS and LifeSensor to facilitate communication between physicians and patients. In 2006, a study conducted by the University of Erlangen concluded that the PPV is the leading medical practice network in Germany with respect to management, structures and IT.

While our extensive European success certainly makes a positive impression, it might not fully satisfy US-based customers. What about ICW's US experience? ICW is fairly new to the US market, but we have US customers.

Torrance Hospital Independent Practice Association (THIPA) Medical Group – ICW is working with THIPA to deploy Professional Exchange Server (PXS) to create a centralized healthcare information network for 138 primary care physicians, 258 specialty physicians and 60,000 patients. The THIPA project also includes integration with third-party products for single sign on, demonstrating the openness and flexibility of the PXS architecture.

PXS is actually a complete integration solution that communicates with disparate medical information systems, resolves multiple patient records into a single master index and aggregates and displays a multitude of patient information and documents.

The solution includes a number of components. Those components include:

Enterprise Master Patient Index (EMPI) – the algorithmic and indexing engine that resolves multiple patient identities across disparate information systems into a single, unique master index.

Enterprise Service Bus (ESB) – the integration engine that handles communication between source systems and the other components of PXS.

Electronic Patient Record (EPR) – a unified view of patient medical data aggregated from the multiple source systems.

The primary qualities of PXS fall into the following categories. PXS is:

Flexible – This refers to many different features and functions, from a high level to a granular one.

Scalability. PXS is a web-based application that utilizes the public network of the Internet and features a typical client-server architecture. Its ability to handle large record sets or large numbers of concurrent users is largely determined by the hardware configuration rather than any software limitations. PXS is designed to scale as more source systems are brought online. ICW recommends this phased approach to deployment. Earlier versions of the product have been thoroughly tested for capacity, requiring less than 1 second to sort through 100 million record sets with 1,000 concurrent users.

Customizability. The native PXS APIs and the ICW Software Development Kit (SDK) allow access to the application to enable customers to extend the product to solve any number of healthcare information challenges. Or, like in the case of THIPA, add third-party administrative features like single sign on from PXS to other non-networked applications. Additionally, the EMPI matching algorithm can be fine tuned to handle the current data quality and data types that exist within the network. Also, the EPR is designed to accommodate and accurately display multiple document, notation and report types. PXS can adapt to any existing data situation within a given county.

Granular Access Control. PXS can define as complex and granular or as simple and open an access control policy as required. Electronic Health Information Exchanges are still novel concepts that will require an element of flexibility as they grow and become a more recognized part of the healthcare environment.

Flexible Data Integration. PXS offers many ways of integrating and collecting data: the ESB, device integration, adapters/interfaces, Software Developer Kit (SDK).

Hybrid Storage Models. PXS offers both centralized and federated—or a hybrid of both—data storage models. This means PXS can act as a repository of data or it can simply be a record locator service which aggregates data that remains on the source systems. This is an added layer of flexibility that differentiates PXS from its competition.

Standards-based – Likewise, standards-based refers to both the underlying architecture and the communication protocols that PXS uses.

Service Oriented Architecture. PXS has been developed according to the key SOA principles.

Open Source Systems and Web Technologies. PXS runs on open source Linux Server and Apache Server Operating Systems. It can also use MySQL, HSQLDB or proprietary Oracle as database servers. PXS is based on established web applications and development technologies like J2EE, Tomcat, ActiveMQ and Open LDAP directory services.

Standards-based. PXS uses HL7 communication standards internally and to communicate with source systems. PXS uses web standards like IP protocol and HTTPS to communicate externally.

Highly Secure – Besides the access control mechanisms mentioned above, all communication, whether from PXS to and from source systems or between PXS and end users, is encrypted. Any data stored by PXS adheres to HIPAA regulations by storing identifying information and medical records separately (and encrypting them).

Cost effective – PXS leverages existing systems by communicating bi-directionally with them and aggregating source system records into a unified electronic patient record. This ensures that previous healthcare system investments are leveraged. PXS simply connects the many disparate health record systems to offer additional functionality that improves patient care and reduces healthcare spending.

RR-F-05 Describe your firm's experience and qualifications in design, development, and implementation of Personal Health Record (PHR) systems.
(5 pages maximum)

We appreciate the opportunity to share our vision for a customized electronic Personal Health Record (PHR), and look forward to helping county Mental Health Departments implement world-class PHR systems that fully satisfy state requirements and meet specific county needs.

We are a consumer-centric organization, and we believe that focus has enabled us to develop an industry-leading PHR that satisfies the primary needs—control, security, flexibility and value—of the eHealthcare consumer.

LifeSensor®, our web-based PHR, empowers consumers to control their own health records and serves as a platform for additional tools to enable healthy behaviors (both in terms of disease management and health and wellness). Our world-class technology delivers advanced features and functions in a private and secure manner. We've identified patient participation as a key missing element in the healthcare information interchange. LifeSensor gives patients more control of their health records and gives them an access and communication point into the greater healthcare environment.

The PHR Philosophy

Increasingly, individuals are turning to the Internet and PHRs to help them manage their health and healthcare. The digital environment provides ready access to general health information

and social networks and growing access to healthcare information that has traditionally resided only within the systems of the provider or the health plan.

In a recent white paper, "Engaging Consumers in Personal Health Records," published by The eHealth Initiative (a consortium of non-profit affiliated organizations led by Janet Marchibroda and focused on driving the improvement of healthcare quality, safety and efficiency), two key data points were noted:

> According to a Pew Internet & American Life research study, 79% of Internet users (95 million American adults) have searched online for information on at least one major health topic.
>
> According to the survey, specific diseases and treatments continue to be the most popular topics, but the greatest growth is in seeking information about doctors and hospitals, experimental treatments, health insurance, medicines, fitness and nutrition.

Recently, the concept of the PHR has been expanded to refer to Personal Health Systems that go beyond the role of a static repository of health information to a system that functions as a platform for hosting and supporting a range of eHealth tools including health risk assessments and interactive applications for wellness and disease management.

LifeSensor PHR

LifeSensor is an online, consumer-centric electronic PHR, working as a platform for integration, communication and federation of personal health data. The solution is technically based on Java Enterprise Edition (Java EE), which leverages an interoperable and modular eHealth Framework. Consumers can manage relevant medical data, be it from their doctor, pharmacy or self-entered, and they can share as little or as much of their health record with anyone—their physician, fitness trainer or family member.

This consumer-centric approach enables individuals to centralize the information on their past and current health status. By managing and using their LifeSensor personal health record, consumers can:

- Educate themselves about health maintenance, wellness practices and diet
- Better understand their healthcare options in the course of treatment
- Access—or grant access to—their health record in an emergency
- Utilize specialized product extensions tailored for expectant and new mothers, diabetics and those suffering from heart disease
- Communicate directly with their providers by receiving notifications or questionnaires

This functionality emphasizes the central role of the individual in an integrated healthcare system. However, we are well aware of the challenges of implementing and offering an electronic PHR, particularly with regard to privacy, security and interoperability.

Security and Privacy

ICW does not just observe the legal requirements for storage and processing of sensitive medical data—we work to exceed them. We have addressed security and privacy concerns at every possible level. Our PHR enforces secure authentication, encrypted data transmission, and storage in highly available datacenters located in multiple locations worldwide.

These proactive steps have helped make LifeSensor compliant with the United States Health Insurance Portability and Accountability Act (HIPAA). In addition, LifeSensor follows the **Health on the Net Foundation's (HON) Code of Conduct**, an internationally-recognized standard for quality and trustworthiness of health information on the Internet.

Recently, LifeSensor became the first and, so far, the only eHealth Provider to receive the Good Priv@cy Data Protection Quality Seal from the Swiss Association for Quality and Management Systems SQS. The SQS auditors certified exemplary data protection in the design, development, implementation and operation of the LifeSensor PHR.

Interoperability

In order to provide real value to a user a PHR must be designed with interoperability as a key service. Integration with both primary systems as well as other PHRs is required in order to prevent duplication of effort. A PHR like LifeSensor is designed to ensure that this is in fact the case. A series of published APIs and security protocols allow for the transport of data both into and through its infrastructure.

For example, opportunities for integration occur in connecting home care or longitudinal care.

There are three components to our interoperable platform—a key differentiator between ICW and other PHR vendors:

ICW eHealth Framework – The ICW eHealth Framework (eHF) is a powerful platform for the development of healthcare solutions consisting of reusable software components and development tools, as well as architectural guidelines and conventions defining a full software development and product lifecycle. For our partners, the ICW eHealth Framework provides services and infrastructure capabilities for applications running on top of the eHF. In this way, the partner does not need to worry about recurring tasks such as persistence and security.

Professional Exchange Server (PXS) – PXS is a connectivity integration platform that allows disparate systems to communicate freely between each other and to provide a universal view of medical data about an individual. Using our enterprise master patient index we identify the individual who may be represented differently across multiple systems via a medical record number, social security number, etc. Our record locator service can then be used to reference the individual's record mirrored from the original source.

Software Development Kit (SDK) – The SDK incorporates a programming interface (API) that can be used by different programming languages via Java technology or Microsoft COM or .NET. The SDK facilitates creating, sending and receiving data that is exchanged between the source systems and our eHealth Framework.

Not only are we focused on developing an interoperable technology platform, we are also advocates for open standards. We have partnered with Agfa HealthCare and Sun

Microsystems, Inc. as foundation members of the new Open eHealth Foundation, an Open Source initiative that is unique in the healthcare IT arena. The Open eHealth Foundation will provide software components under an Open Source license that will boost the open standards-based exchange of medical information.

Thank you for taking the time to learn more about LifeSensor PHR and ICW. If you have any additional questions, please do not hesitate to contact us. We look forward to further discussions.

RR-F-06 Describe your firm's experience and qualifications for Systems Integration.
(3 pages maximum)

County Mental Health Departments sit at the center of a complex set of overlapping IT systems. Our team has extensive experience integrating IT systems in similar public health environments that include behavioral health components and matrix security access to private information for care provision. In the mental health environment, the ability to limit access to specific sets of information to key individuals is especially critical to protect patient privacy.

Our partner Lumetra's systems integration experience includes connecting acute care and ambulatory care data environments with internal and external ancillary systems, including transcription, disease management, billing, and imaging systems. This brokering of information is key to the provision of patient care, operational effectiveness, and financial stability.

Lumetra's staff has also been instrumental in building appropriate master patient indexing (MPI) capabilities associated with systems integration, providing consistency of identification across platforms into centralized sources. In addition, our team has experience integrating sets of information within Clinical Data Repository (CDR) systems that allow for episodic and longitudinal views of comprehensive data sets for the provision of patient care and data reporting.

Lumetra's systems integration clients Include:

- Duke University Medical Center, NC
- Aurora Health, WI
- St. John's Hospital, Tulsa, OK
- WebMD

ICW's data integration experience has been mentioned extensively above in our answers to RR-F-04 and 05.

We have developed a framework and tools to enable easy integration of our products into other systems. We have an API and SDK available for third parties to extend the functionality offered by our products. Also, since our solutions are wholly web-based and leverage public networks, third parties can also query data via secure HTTP communication. This allows certain parts of the patient's EHR to be integrated into a third party application.

The SDK incorporates a programming interface (API) that can be used currently by different programming languages via Microsoft .NET. There are future plans to extend this to Java and Microsoft COM.

ICW has undergone projects for Memorial Hospital of Rhode Island (MHRI) and Coventry Healthcare in which we have integrated our products into those institutions' third party and homegrown systems. Please consult elsewhere in this document for more details on our integration work with MHRI and Coventry in section **O.**

ICW is well versed in overcoming systems integration challenges. When combined with Lumetra's systems integration consulting experience, our team offers California county Departments of Mental Health the ability to integrate our state-of-the-art IT solutions with existing legacy systems in ways that will enable counties to reach their care delivery goals.

RR-F-07 Describe your firm's experience and approach to the conversion of electronic behavioral health data.
(1 page maximum)

RR-F-08 Describe your firm's experience and approach to the conversion of paper-based behavioral health data.
(1 page maximum)

G. Solution Product History

RR-G-01 Please provide the following information about the solution product(s) that you propose.

#	PRODUCT NAME AND PRIMARY FUNCTION	WHEN FIRST DEVELOPED	WHEN / WHERE FIRST DEPLOYED	NUMBER OF INSTALLATIONS TO DATE
1	PROFESSIONAL EXCHANGE SERVER – ELECTRONIC HEALTH RECORD AND MASTER PATIENT INDEX	2004	2005 / GERMANY – HIEDELBERG UNIVERSITY MEDICAL	12
2	LIFESENSOR PERSONAL HEALTH RECORD	2000	2002 / GERMANY – INTERNET	50,000+ RECORDS
3	ICW INTEGRATION PLATFORM	2006	2007 / GERMANY	15
4	CARE AND DISEASE MANAGER	2005	2007 / GERMANY – PARTNERSHIP FOR THE HEART	7

RR-G-02 For each solution product listed in the above table, please provide:

Professional Exchange Server (PXS)

1. The history of the product including whether the product was internally developed or acquired from another source.

Developed in 2004 as a provider-centered, data exchange platform, Professional Exchange Server (PXS) was internally developed and offers a consolidated, cross-organizational view of electronic health records whose data originates from integrated source systems (e.g. hospital information systems, practice management systems) or from other disparate data sources like laboratory or diagnostic imaging systems.

2. The specific Industry standards that the product was designed to, including any exceptions to those standards.

HL7, CCR, CDA, IHE, Any code system, eg. Icd-9, icd-10, Snomed, Loinc, etc.

Please refer to the list of standards for all products below.

3. Whether the product is CCHIT certified.

N/A

LifeSensor Personal Health Record (PHR)

1. The history of the product including whether the product was internally developed or acquired from another source.

LifeSensor PHR was internally developed in 2000 as a consumer-focused electronic medical record. The ICW LifeSensor is a consumer-focused web application based on Java Enterprise Edition (Java EE). LifeSensor manages relevant medical data made available by different provider systems as well as data entered directly by consumers.

2. The specific Industry standards that the product was designed to, including any exceptions to those standards.

HL7, CCR, CDA, IHE, Any code system, eg. Icd-9, icd-10, Snomed, Loinc, etc.

3. Whether the product is CCHIT certified.

N/A

ICW Integration Platform (IPF)

4. The history of the product including whether the product was internally developed or acquired from another source.

The Integration Platform was originally internally developed as a part of PXS, but has sense become a stand alone platform acting as an enterprise service bus, terminology server and data normalizing engine.

5. The specific Industry standards that the product was designed to, including any exceptions to those standards.

HL7, CCR, CDA, IHE, Any code system, eg. Icd-9, icd-10, Snomed, Loinc, etc.

6. Whether the product is CCHIT certified.

N/A

Care and Disease Manager (CDM)

1. The history of the product including whether the product was internally developed or acquired from another source.

Care and Disease Manager (CDM) was internally developed in 2005 to offer a healthcare-focused business rules and workflow engine that helps providers or payers monitor patient populations.

2. The specific Industry standards that the product was designed to, including any exceptions to those standards.

HL7, CCR, CDA, IHE, Any code system, eg. Icd-9, icd-10, Snomed, Loinc, etc.

3. Whether the product is CCHIT certified.

N/A

Standards

a. Health Level 7 (HL7)

b. Public Health Information Network (PHIN)
c. National Institute of Standards and Technology (NIST)
d. International Organization for Standardization (ISO)
e. American Society for Testing Materials (ASTM)
f. Federal Public Key Information Policy Authority (FIPS)
g. Healthcare Information and Management Systems Society (HIMSS)
h. Liberty Alliance
i. Request for Comments Series
j. American National Standards Institute (ANSI)
k. The Open Group (TOG)
l. Object Management Group (OMG)

ICW is a global leader in the support and development of healthcare information exchange standards. Our products and our development framework adhere to the most rigorous and current messaging standards.

For example:

- **HL7** (v2 and v3)
- ICD9 and ICD10
- CPT4
- IHE PIX
- SNOMED
- DICOM
- LIONC
- **ISO**
- NCPDP (SureScripts)
- HIPAA x.12
- RxHub
- Continuity of Care Record (CCR) – **ASTM**
- Clinical Document Architecture (CDA) – **HL7**

In addition, ICW is a contributing member of HIMSS and Integrating the Healthcare Enterprise (IHE). We are continuously developing, analyzing and testing our products and solutions. We participate in conformance tests at annual IHE Connectathons. At the European IHE Connectathon 2007 and the US Connectathon 2008, we successfully tested our network solutions for clinics and physician networks to see whether they conform to the IHE PIX profile and other profiles.

Also, as mentioned elsewhere, ICW is a founding member of the Open eHealth Foundation to help provide Open Source components for eHealth applications. Below is a short

summary of the mission of the Open eHealth Framework. We are also at the forefront of defining standards for Personal Health Records.

Open eHealth Foundation

- Nucleus of broad healthcare industry alliance
- Promoting eHealth within the healthcare sector
- Providing an organizational, legal and financial frame for open source software projects
- Open Source development platform and community
- Independent non-profit entity
- Work results comprise
    - standardized data model implementations
    - extensible frameworks
    - tools for building, deploying and managing software solutions
- "Making standards work"

As a company, ICW is completely focused on solving the challenges of healthcare information exchange, but we are also a company that offers web-based solutions. As a computing platform, the Internet demands the use of widely recognized and adopted standards. So, while our standardization efforts often lean toward healthcare-specific messaging, our products adhere to many of the general technology and secure computing standards mentioned above like those of **NIST**, **ANSI**, **RFC, FIPS** and others.

RR-G-03 How are enhancement and new release priorities determined?

The ICW software release plan calls for new releases every three months. The sub-department Roll-In is responsible for the planning and release schedule. Roll-In management follows a process which involves the customer and ICW in a synergistic capacity. Priorities that are required by the customer must be discussed for full functional analysis and the release must be agreed to by the customer and ICW.

Roll-In Process

The Roll-In process begins with a submission of new requirements to the product team. The requirements must be provided approximately 14 weeks before the release date. The new requirements are reviewed by product management to evaluate all functional and non-functional requirements.

The final outcome of a functional qualification is the requirement specification (RS) document designed by the product manager and customer. In general, the deadline for RS is two to three months before release date. The requirements will then be scheduled into the upcoming

development iterations. The final decision is made by ICW management in coordination with the ICW Board and ICW subsidiaries who determine what will be developed in the upcoming releases. It is then passed back to product management to begin the development process.

The development process follows an interpretation of agile software development called *Scrum*. Scrum is an iterative incremental process of software development that allows ICW to be very flexible in our release to respond to customer needs with agility. Planning and development are defined by 3-week sprints. During each sprint the team decides on a set of high-level requirements that can be developed by the end of the sprint.

RR-G-04 How are clients supported during the release of an enhancement?

Release notes are provided for each enhancement. Release support varies by customer and is negotiated during contracting.

RR-G-05 Describe the size of the installed base of your solution. Include the number of users and the number of sites where the product is installed.

There are currently 18 different installations of the various products mentioned in the RFI. Some are full installations, others are integrated with partner products or third party applications. The number of users for a given installation varies from 400 to over 1000 for the provider-focused applications. But for the consumer-focused PHR there are more 50,000 users across Europe and North America.

RR-G-06 Describe any regularly-held seminars or user group meetings available to users of your product and the time/place of the next gathering.

ICW Developer Network (IDN) is the primary communication platform for technical experts to share knowledge around ICW products and technologies.

- knowledge bases
- discussion forums
- blueprints
- expert blogs
- tutorials

Please visit the site at http://idn.icw-global.com for more information.

The last conference was held in May of 2008.

H. Solution Product Technologies

Software Technologies

RR-H-01 Provide the technologies used for each solution product identified above.

Please refer to the attached documentation for answers to questions 1-5.

#	PRODUCT NAME	PRODUCT TYPE (CLIENT SERVER, WEB, ETC.)	OPERATING SYSTEM (WINDOWS, UNIX, LINUX, ETC.)	DATABASE (SQL SERVER, ORACLE, DB2, ETC.)	APPLICATION LANGUAGE (VB6, VB.NET, C, C++, C#, JAVA ETC.)
1					
2					

Server Hardware Minimum Specifications

RR-H-02 In the following table, please provide the minimum server hardware technical specification levels for operation of your solution software products. Please consider all types of possible servers such as: database, fax, email, internet, backup, image management, etc.

#	PRIMARY SERVER PURPOSE	NUMBER OF PROCESSORS PER SERVER	PROCESSOR TYPE/SPEED (MHZ)	MEMORY (GIG)	STORAGE (GIG)
1					
2					

Client Hardware Minimum Specifications

RR-H-03 In the following table, please provide the minimum client hardware technical specification levels for operation of your solution software products. Please consider all types of client types including workstations, tablet PCs, PDAs, etc.

#	TYPE OF CLIENT HARDWARE	OPERATING SYSTEM	PROCESSOR TYPE / SPEED (MHZ)	MEMORY (GIG)	BROWSER LEVEL (IF APPLICABLE)	REQUIRED DISK SPACE (IF APPLICABLE)
1						
2						

Peripheral Hardware Minimum Specifications

RR-H-04 Provide the minimum peripheral hardware technical specification levels for operation of your solution software products. Please consider all types of peripherals such as printers, scanners, card readers, notepads, etc.

#	TYPE OF PERIPHERAL HARDWARE	OPERATING SYSTEM (IF APPLICABLE)	SPECIFICATIONS/CHARACTERISTICS
1			
2			

Minimum Network/Communication Specifications

RR-H-05 Provide the minimum network/communication technologies employed by your solution software products.

#	TYPE OF NETWORK/COMMUNICATION TECHNOLOGY	OPERATING SYSTEM (IF APPLICABLE)	SPECIFICATIONS/CHARACTERISTICS
1			
2			

System Backup/Recovery Considerations

(Not to exceed 4 pages)

RR-H-06 Describe the system backup process for your core product.

ICW employs regular (e.g. nightly) backups as well as system snapshots taken to ensure fault tolerance.

With multiple data centers across the globe, any backup configuration (mirroring, failover) can be implemented depending on the needs and resources of the customer.

Data backup for ICW Professional Suite is divided into the following categories, depending on the components:

Application server

The program files are supplied on compact disc and can be re-imported at any time. Any changes to the configuration files and the log files that are created during operations would be backed up daily in a combined backup procedure.

Web server

The same specifications apply for this server as for the application server. After initial installation or after an update, the installed program files are backed up in full.

Database

The database would be backed up at regular intervals: daily, if possible. This accelerates any restoring. It would not be necessary to stop the application to supply a backup of the data residing in the database.

Operating System

YAST (a tool included in the operating system) can be used as a backup solution for the Operating System. However, a complete backup of the Operating System would possibly require shutting down the application if a redundant host is not available to assume the role of the host to be backed up.

Complete backup

Currently, scheduling for a complete backup of all the systems including the operating system for the ICW Professional Suite's components does not exist when the systems are built in a non-redundant configuration, as this would involve shutting down the system. However, if more than one application server is in use, they could be shut down in series for a weekly complete backup.

We recommend a complete backup once a week and during running system operations, as well as incremental backups during the week. This backup strategy should provide for a rotating exchange of backup media, in line with the grandfather-father-son procedure.

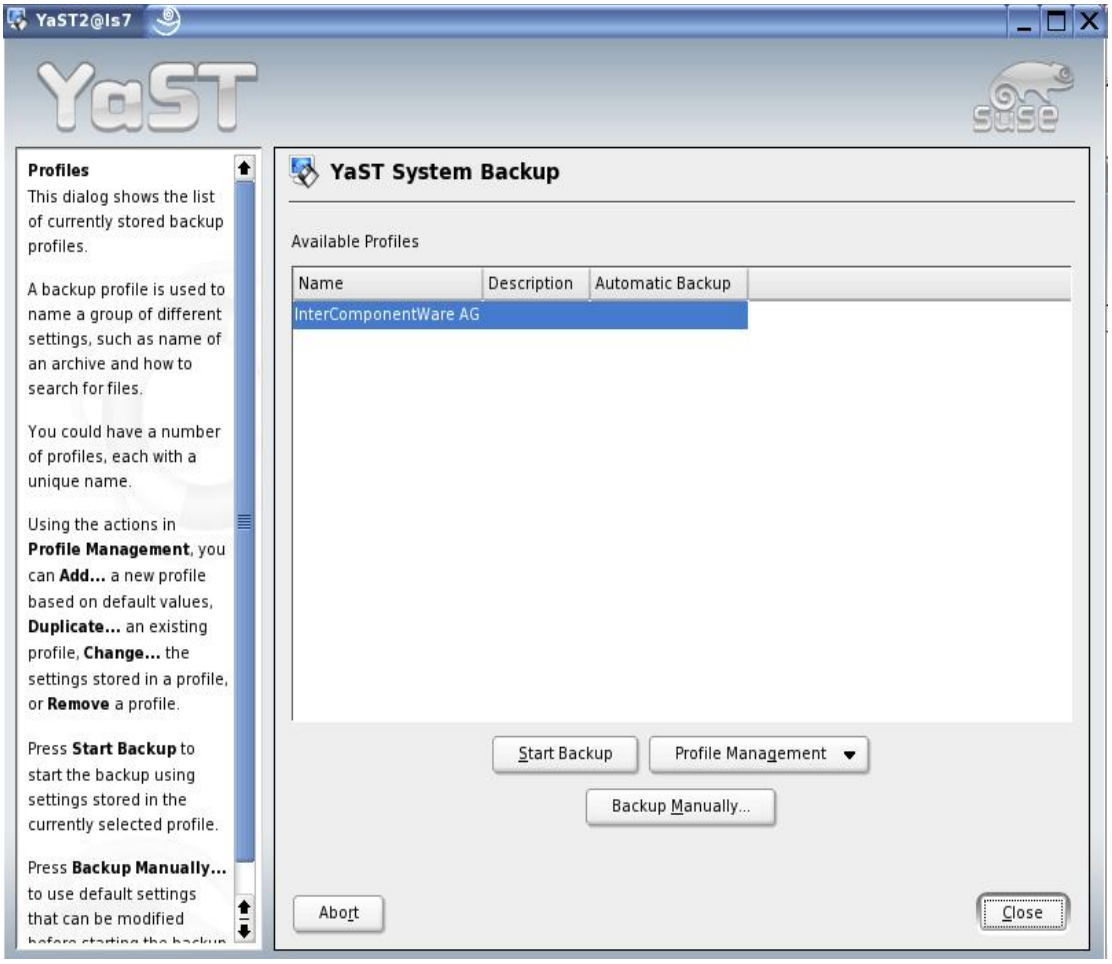


Figure 1

RR-H-07 Can backup be completed in a dynamic mode so that the system can be operational 24 hours per day?

Yes

RR-H-08 Describe any automated backup features that allow rapid and unattended backups of system and operational data on a user-scheduled basis.

See above in answer RR-H-06

RR-H-09 Can the system be configured to support improved fault tolerance and system recovery (e.g., mirrored disk drives/servers)?

Yes, see above for more details.

Data Archiving Considerations
(Not to exceed 4 pages)

RR-H-10 What are the capabilities for archiving data?

We do not currently have an out-of-the-box archiving solution, but we are open to integrating with any preferred third-party application.

RR-H-11 What are the capabilities for restoring archived data?

n/a

RR-H-12 What tools/media are used for archiving data?

n/a

System Interface Considerations

(Not to exceed 3 pages)

RR-H-13 Describe your overall approach to developing, testing, implementing, and upgrading system interfaces to other third-party systems. Describe the process you use to settle disputes over interfaces between your solution and others.

We have an API and SDK available for third parties to extend the functionality offered by PXS. Also, since PXS is wholly web-based and leverages public networks, third parties can also query patient data via secure HTTP communication. This allows certain parts of the patient's EPR to be integrated into a third party application.

The SDK incorporates a programming interface (API) that can be used currently by different programming languages via Microsoft .NET. There are future plans to extend this to Java and Microsoft COM. The SDK primarily offers the following functionality:

- Register a new patient.
- Create patient-specific encounter information.
- Upload a document to a patients (virtual) record.
- Retrieve a list of stored documents belonging to a patient.
- Download a document from that list.

The object-oriented API enables source system manufacturers to access the PXS application through their standard development environment. At the same time, the SDK ensures greater independence—if interfaces within the infrastructure change, it is often sufficient to only update the SDK. In these cases, the interface to the source system usually remains unchanged. The SDK also encapsulates the low-level communication protocols. In essence, by working at the object level, the developer does not need to be concerned with the intricacies of a web services call.

Other benefits of the ICW SDK:

- The SDK significantly reduces integration expenses since changes can be made easily in SDK thereby avoiding the need to alter the interface to the source system
- Stream of enhancements—regular updates always guarantee connection to the current interfaces of PXS
- Complies with industry and national standards and requirements
- Uncomplicated error recovery and logging

- Professional and peer support from the ICW Developer Network (IDN), online help, user manual and bi-annual user conferences

RR-H-14 With what version of HL7 is your product compliant?

2.2, 2.3, 2.3.1, 2.4, 2.5 (2.6 is not currently supported, but support is planned) HL7v3

Data Security Considerations

(Not to exceed 3 pages)

RR-H-15 Discuss your approach to data/information security, especially with regards to Internet technologies. What level of encryption and authentication is supported?

ICW solutions are supportive of the Health Insurance Portability and Accountability Act (HIPAA). We have implemented administrative, physical and technical safeguards that reasonably and appropriately protect the confidentiality, integrity and availability of Electronic Protected Health Information. This section will detail the Technical and Physical Safeguards pursuant to the HIPAA Security Rule.

There are many facets and components of our security process. Secure communication between user and web application. Secure storage of sensitive data. Secure facilities. Individuals tasked to lead and monitor ICW's adherence to the highest possible security standards.

We provide the tools to secure critical information and to encrypt data communicated across care settings and systems.

Authentication

Authentication into the LifeSensor account can be accomplished in 3 ways: via username/password, X.509 client certificates (including smart cards) or secure emergency PIN codes.

As with any secure website, users select their login names and passwords. We try to enforce as strong an authentication mechanism as possible.

Users are asked to select a password according to the following rules:

- A password must have between 8 and 256 characters and must be comprised of at least two of the following four groups of characters:
    - Lower-case letters

- Upper-case letters
- Numbers
- Special characters *[](){}!@#\$%_

Additionally, only the owner of the LifeSensor personal health record has the right to manage access rights for her health record. If necessary, they can allow access by third parties, for instance a family physician, a care giver, or a relative. The health record's owner or any user with the appropriate permissions can view and correct the data recorded, or take any actions based on the rights they've been granted. Access rights can be restricted to a certain period of time. The various access profiles can be altered or removed at any time. This is discussed in more detail in our response to Question 19.

Secure Connections

Any communication between the LifeSensor server and the web browser is made over the secure HTTP protocol (HTTPS), which uses the Secure Socket Layer (SSL) encryption to safeguard data integrity. The secure SSL encryption is certified by VeriSign, one of the most respected companies worldwide in electronic communication and personal data handling.

The key length currently used by the HTTPS protocol is at least 128 bit, which is one of the highest encryption levels available today.

Furthermore, when integration between LifeSensor and other health information systems is required, Virtual Private Networks (VPN) are used for the data transfer. VPNs use IPsec, which is a suite of protocols for securing Internet Protocol (IP) communications by authenticating and/or encrypting each IP packet in a data stream, hence securing its transfer and full integrity.

Secure Electronic Storage

Your personal health record contains both medical and personal information. These are always saved separately from each other, so that it is impossible to infer anything about you from the medical data alone.

Once data is entrusted to ICW, encryption at the database level further protects sensitive data such as personal identification information. The data is encrypted using 3DES or AES with up to 256 bits.

Auditing

All access requests, additions and alterations to the health record, and the name (or pseudonym) of the user making them are logged in a separate audit database, which can only be accessed by the database administrator.

Server Backups

To ensure the availability of your health data at all times, the hardware is set up accordingly, with mirrored server hard drives, safeguarded power supplies and complete daily backups. In addition, our computers are under continual supervision. New installations and software upgrades are only made after thorough and successful tests by authorized personnel.

Hardware Protection

The LifeSensor servers are protected by multi-stage firewalls. Incoming data packets must pass through several filters before being accepted. The data stored on the server cannot be accessed except via the LifeSensor login.

Security in our Datacenters

When it comes to the physical security of our datacenters, ICW makes no compromises. Our datacenters offer total security around the clock, including security barriers, CCTV surveillance, alarm systems, 24-hour on-site supervision, and visual identification of all persons entering the building.

- Access
  The buildings, data floors and individual rooms can only be accessed using personalized Proximity Access Cards (PAC) whose use is centrally logged with date and time. No unauthorized person can use the cards, because a digital photo of the cardholder appears on the security system screens each time the card is used. This system is permanently under surveillance by technicians on site, who check the identity details and only then grant access.
- Building Management System (BMS)
  Our facilities employ a computer-controlled Building Management System with sensors for electrical and mechanical defects, fire protection and leakage recognition.
- Power Supply
  We guarantee a constant and reliable power supply. A minimum of 1kW per square meter of secured power is always available and this can be supplied by an on-site generator for an indefinite length of time. In case of power failure, the generator can cover the needs of our customers as well as the center itself. All our facilities are built on the principle of N+1 standard, meaning that if two generators are necessary for an uninterrupted power supply, three are installed. This guarantees 100% availability.
- Fire Prevention
  An Early Smoke Detection Apparatus (VESDA) is installed in each of our data centers. These high-sensitivity smoke detectors are connected to the Building Management System, which is continuously observed from our Network Operation Center. The detectors are connected to environmentally-friendly gas fire extinguishers which can quell the fire immediately without destroying the equipment.
- Climate Control
  To guarantee optimal operations, all data floors are kept at a constant temperature of 21°C with 50% humidity. These levels are also monitored by the BMS.

Scalability Considerations

(Not to exceed 3 pages)

RR-H-16 Describe your product's ability to expand to accommodate increasing numbers of users, servers, etc.

See the answer below for testing results. We would be happy to provide additional test metrics your request.

RR-H-17 Provide any performance metrics that describe the maximum load(s) under which your system can continue to perform at an optimum level

In a weeklong test at the Hewlett-Packard European Performance and Benchmark Center in Boblingen, Germany, engineers proved how quickly and reliably the EMPI could locate individual patient data from a large amount of information under extreme conditions. At the testing center, experts from ICW and HP set up a database with 100 million patient records and executed queries made by up to 1000 concurrent users to test response times. In repeated tests, PXS achieved stable response times of less than one second.

RR-H-18 It is possible that many counties will want to work with the same vendor. How would your company mitigate the impact from potentially high-volume purchases from multiple counties in California? Include in your answer the need to hire additional staff, increase locations and the possible impact to implementation and training schedules, and problem response times.

I. Behavioral Health EHR Functional Requirements Survey

RR-I-01 Please complete the CA BH-EHR Functional Requirements Survey (an Excel spreadsheet) that accompanies this RFI. **The Functional Requirements Survey is part of this RFI and must be completed.**

Functional Requirement Survey Categories

The CA BH-EHR Functional Requirements Survey contains the functional requirements for each of the following DMH Integrated Information System Roadmap Categories:

1. **Infrastructure**
2. **Practice Management**
3. **Clinical Data Management**
4. **Computerized Provider Order Entry (CPOE)**
5. **Electronic Health Record (EHR)**
6. **Personal Health Record (PHR)**

Descriptions of the DMH Integrated Information System Roadmap Categories are provided in the Preface (Section A) of this document. The following table summarizes the number of functional requirements within each of the DMH Roadmap Categories. Descriptions of the Functional Requirement Categories are available in the spreadsheet.

DMH Roadmap Category	Requirement Category Number	Functional Requirement Category Name	Number of Requirements	Total per Roadmap Category
1 Infrastructure	F35	Enforce Confidentiality	5	
	F36	Data Retention, Availability, and Destruction	8	
	F37	Audit Trails	3	
	F38	Extraction of Health Record Information	4	
	F39	Concurrent Use	4	
	F43	Administrative Workflows / EHR Support	10	
	S01	Security: Access Control	12	
	S02	Security: Authentication	14	
	S03	Security: Documentation	1	
	S04	Security: Technical Services	12	
	S05	Security: Audit Trails	7	
	S06	Reliability: Backup/Recovery	4	
	S07	Reliability: Documentation	9	
	S08	Reliability: Technical Services	2	96

DMH Roadmap Category	Requirement Category Number	Functional Requirement Category Name	Number of Requirements	Total per Roadmap Category
2 Practice Management	F01	Identify and Maintain a Client Record	11	
	F02	Manage Client Demographics	11	
	F15	Manage Consents and Authorizations	2	
	F15a	Manage Patient Advance Directives	3	
	F20	Support Non-Medication Ordering (Referrals, Care Management)	3	
	F24	Inter-Provider Communication	1	
	F26	Provider Demographics	3	
	F27	Scheduling	5	
	F28	Report Generation	25	
	F30	Service/Treatment Management	3	
	F31	Rules-Driven Financial and Administrative Coding Assistance	6	
	F32	Eligibility Verification and Determination of Coverage	9	
	F33	Manage Practitioner/Client Relationships	4	
	F40	Mandated Reporting	10	
	F41	Administrative A/P EHR Support	14	
	F42	Administrative A/R EHR Support	34	
	F43	Administrative Workflows EHR Support	18	162
3 Clinical Data Management	F03	Manage Diagnosis Lists	8	
	F04	Manage Medication Lists	13	
	F05	Manage Allergy and Adverse Reaction Lists	7	
	F06	Manage Client History	2	
	F07	Summarize Health Record	1	
	F08	Manage Clinical Documents and Notes	24	
	F09	Capture External Clinical Documents	2	
	F10	Generate Client Specific Instructions	5	
	F14	Manage Results	3	
	F16	Support Standard Care Plans, Guidelines and Protocols	1	
	F17	Capture Variances from Standard Care Plans, Guidelines, and Protocols	1	
	F19	Support Medication/Immunization Administration or Supply	5	

DMH Roadmap Category	Requirement Category Number	Functional Requirement Category Name	Number of Requirements	Total per Roadmap Category
	F21	Present Alerts for Ddisease Management, Preventive Services and Wellness	8	
	F22	Notifications and Reminders for Disease Management, Preventive Services and Wellness	6	
	F29	Health Record Output	5	
	F30	Service/Treatment Management	3	
	F34	Update Clinical Decision Support System Guidelines	2	
	I04	Clinical Documentation	2	98
4 Computerized Provider Order Entry	F04	Manage Medication Lists	1	
	F11	Order Medications	26	
	F12	Order Diagnostic Tests	7	
	F13	Manage Order Sets	3	
	F14	Manage Results	4	
	F18	Support for Drug Interactions	10	
	F25	Pharmacy Communication	1	
	I02	Imaging	2	54
5 Interoperable EHR	F06	Manage Client History	1	
	F24	Inter-Provider Communication	1	
	I01	Laboratory	5	
	I02	Imaging	3	
	I03	Medications	6	
	I05	Clinical Documentation	9	
	I06	Chronic Disease Management/ Patient Documentation	1	
	I07	Secondary Uses of Clinical Data	4	
	I08	Administrative & Financial Data	3	
	I09	Clinical Trials	4	37

DMH Roadmap Category	Requirement Category Number	Functional Requirement Category Name	Number of Requirements	Total per Roadmap Category
6 EHR with PHR	F06	Manage Client History	1	
	F15	Manage Consents and Authorizations	1	
	I03	Medications	1	
	I04	Clinical Documentation	1	
	I05	Chronic Disease Management/ Patient Documentation	3	7
		Total Requirements		**454**

CA BH-EHR Functional Requirement Survey Responses

STEPS	INSTRUCTIONS
1	Rename the spreadsheet by selecting **File**, then **Save As**, then **appending "for " and your company name to the end of this filename** and selecting **Save**. The new file name should be: "CA BH-EHR Functional Requirements Survey for <your company name>.xls"
2	Complete the "Company Info" Tab.
3	Please respond to all of the requirements in all 6 of the Functional Categories: **Infrastructure, Practice Management, Clinical Data, Computerized Provider Order Entry (CPOE), Electronic Health Record (EHR) and Personal Health Record (PHR).** Descriptions of the available responses are provided below. Descriptions of the Functional Requirement Categories are provided on the **Descriptions** tab. For each requirement enter a 1 under the response that best describes your solution's ability to meet that requirement. Respond to every requirement even if your solution does not address a particular functional category. A response of "Not Addressed" has no negative connotation when the solution is not purported to provide that category of functionality. Please provide only one response per requirement. Multiple responses will be regarded as invalid. Use the **Summary** tab to see whether any functional category has missing or invalid responses.

Responses	Response Descriptions
Existing	The vendor's solution meets the functional requirement as an existing component of its base product without any effort over and above code table configuration. This response indicates that no programming customization is required to meet the requirement.
Planned	The vendor's solution does not presently meet the functional requirement, but an upgrade to the base product that will meet this requirement is planned within the next 12 months. This response indicates that no programming customization will be required to meet the requirement.
Modification	The vendor's solution does not meet the functional requirement, but will meet the functional requirement with a programming modification to the base product.
Custom Development	The vendor's solution does not meet the functional requirement with any level of modification to the existing code base. The vendor will meet this functional requirement by developing custom software.

Third-Party	The vendor's solution does not meet the functional requirement with any level of modification or customization, but will meet the functional requirement by integrating third-party solution(s). Identify the third-party vendor(s) and product(s) in the Comments.
Not Addressed	The vendor's solution does not and will not address this functional requirement.

J. Implementation Planning

(Not to exceed 5 pages.)

RR-J-01 Describe your suggested best-practice approach to implementing your solution. Please include details regarding data conversion and training, and how these activities contribute to your suggested approach.

Project Organization

ICW delivers projects using industry best practices for Project Management based on standards promoted by the Project Management Institute (PMI). All ICW client projects are lead by PMI certified Project Management Professionals. Each Project Manager works with the implementation team and the customer to define the high level goals for the project and defines success criteria to measure the completion of the project.

Project Team

Each project team is assembled from ICW and client team members. ICW staffs projects with US and international employees. ICW may bring in additional consultants and external team members to assist on a short term basis to assist in specific project deliverables. Throughout the duration of the project, the client is expected to assign and empower appropriate personnel to work on the project team. Client commitment, including staffing, is critical to the success of the project.

Project Management Software

ICW uses a combination of Microsoft Project and Planview project management software. Individual projects are typically administered by the local project manager using Microsoft Project. The local project manager is empowered to determine the appropriate level of detail to build into the software. Local project managers are responsible for tracking to the project plan. At the enterprise/global level, ICW uses Planview for human resource allocation and scheduling.

Project Execution

Projects at ICW follow an industry standard process based on the PMI Body of Knowledge. This methodology contains a number of management controls that are used to clarify and organize the work. Projects are composed of two phases. Phase 1 is analytically focused. The work product of phase one culminates in the customer acceptance of the Customer Requirements Specification. Phase 2 of the project is focused on the design and implementation of a customer solution to the functional needs described in Phase 1. The implementation phase ends when the solution goes into an operational mode.

Sample Project Plan and Timeline

For reference, a sample project implementation plan has been included in this response. This project plan has been used as the basis for several ICW Professional Suite implementations.

Consulting and Implementation Services

Typical implementations of ICW software into a business environment require client involvement for data provisioning. Beyond the typical implementation, ICW can provide consulting and implementation services in fields related to information technology, systems management, and business strategy. If needed, these services can be purchased on an hourly basis from ICW. ICW also has relationships with several international consulting organizations and systems integrators who can bring additional capabilities to an organization.

RR-J-02 What is the typical implementation timeframe for your solution? Express your answer as a range (6 to 12 months, 1 to 2 years, etc.) qualified by a size-of-project; factor such as number of users, total project cost, etc. An example would "6 to 12 months for a total project cost not exceeding $500,000" etc. Please feel free to share any metrics that you typically use to estimate the timeframe for the implementation for your solution.

For each project we would do an assessment to determine the timeframe for implementation. With few impediments or the risks mentioned in section N, a typical implementation would take from 3 to 6 months. A more complex implementation could take up to a year.

K. Training and Documentation

Training

(Not to exceed 2 pages)

RR-K-01 Describe the types of training offered, i.e., end-user, systems administrator, installer, etc.

ICW uses both direct end-user training methods and technical "Train the Trainer" methods to scale training requirements to the needs of a particular customer. The particular model depends on the type of users, the number of users and the depth of training needed. Typically, administrator users are trained directly while most staff level end users are trained by client trainers via a "Train the Trainer" process.

ICW offers training live at the customer site, live internet delivered training, and self paced computer based training. Many of ICW's customers maintain on-site training rooms and this is typically the most efficient place to conduct these classes. ICW recommends that a maximum class size of ten participants to one trainer is maintained.
ICW products targeted for a professional end user have general training manuals available on a release basis. While each client may have a high degree of customization, these manuals will help end users understand product features and use in a general sense.

RR-K-02 How often is training offered (as needed, or on a set calendar schedule)?

Training systems have application code that is identical to the current production release. Compared to production installations, training system deployments are simplified by

reducing or eliminating external interfaces and minimizing database size. When needed, training can be done on unreleased future code bases – subject to specific client needs. The training data that is available in these systems does not originate in a production system. The data is constructed to fit plausible training scenarios, but is fictitious and not copied from production records.

ICW uses both local implemented training systems and centralized training systems. At this time, training installations are built per class and are configured identically to specific customer installations. The specific training scenarios are defined by ICW's Medical Competency Center and are built by ICW training and Professional Services teams.

Additional ICW training can be provided on a time and materials basis at the request of the customer.

RR-K-03 Please give the duration of each class, the location of training and the recommended number of people that should attend training.
Training Programs

Training	Typical Duration	Trained by	Comments
Client Administrators	3 Days	ICW Professional Services and Training	2.0 days per training session
Client Trainers	2 Days	ICW Training and Product Management	"Train the Trainer" class Less than 1 day per training session
Client End Users -	2 Days	Client Trainers	4 to 8 hours per application
Technical/ Developer	Ongoing	Online, seminar	SDK, eHF, user groups, development conferences

Table 1 - Training Programs

RR-K-04 Please describe if training is classroom style with an instructor, one-on-one, computer-based training, self-study, etc.

See above, Training is available in all of the above methods.

RR-K-05 Who provides the training: employees of your company or sub-contractors?

All instruction is currently provided by ICW staff or trainers that are certified by ICW.

RR-K-06 Do you provide clinician-specific training?
Yes, on an as needed basis.

RR-K-07 Do you provide fiscal-specific training related to billing Short-Doyle Medi-Cal in California?

N/A

Documentation

(Not to exceed 2 pages)

RR-K-07 Describe the documentation (both system and training) provided as part of standard installation approach including:

1. Manager and user reference manuals (applications).
2. User operator/system administrator manuals.
3. Hardware/OS manuals.
4. Network and Security.
5. Training manuals (initial and ongoing user self-training).

RR-K-08 Is the documentation available:

1. In hardcopy?
2. On CD-ROM?
3. On the Local Area Network?
4. On the Internet?

RR-K-09 How often is your documentation updated? How often are updates made available to the user? How is documentation updated (memo, revised manuals, on-line, CD, etc.)?

L. Contractual Support

(Not to exceed 4 pages)

RR-L-01 Do proposed acquisition and/or ongoing maintenance/support costs include:

1. Future enhancements to acquired/licensed application modules?
2. Operating system and related environmental software?
3. Interface maintenance?

4. Architectural changes such as migration to emerging technologies and new methods of systems deployment?

If not, describe the conditions and terms under which enhancements/new releases are made available to existing customers.

Yes

RR-L-02 What are your normal support hours (specify time zone)? Where is support staff located?

Most English speaking support staff is available from 6am to 6pm Pacific time.

RR-L-03 Which of the following support features are available? Check all that apply:

1. Toll-free hotline ☒
2. Remote monitoring ☒
3. Remote diagnostics ☐
4. Training tutorials ☒
5. Web-based support tracking ☒
6. 24x7 software support ☒
7. 24x7 hardware support ☐

RR-L-04 Provide the response time for problems reported during:

1. Regular business hours.
2. Off-hours.

RR-L-05 Describe your problem reporting software and tools. Are they available via the Internet? Can a list of outstanding problems and enhancements by client be viewed on-line and downloaded?

ICW uses a bug reporting tool called JIRA. It is available via the Internet.

RR-L-06 Describe your firm's approach to software maintenance agreements. Include how, and at what frequency, your firm provides maintenance and upgrade services in support of your system products.

Please see our answer to RR-G-03

M. Cost and Licensing

(Not to exceed 3 pages)

RR-M-01 Describe your pricing and/or licensing models based on the various product functionalities listed above. Do not provide specific pricing in your response, but information on how pricing is derived is pertinent. Examples of pricing models may be: module-based pricing,

package or suite pricing, single price package, subscription based, package plus maintenance, etc.

ICW's pricing methodology for the EHR and PHR solution is based upon a perpetual license, plus annual maintenance and support, model. The variables, which could impact the total cost of the solution, are as follows:

- Number of unique patient records managed through the system
- Number of source systems to connect to the exchange
- Services (hours) required to implement the solution
- Services (hours) required for training

ICW is committed to providing CA-DMH a flexible cost model that will fit within CA-DMH's budgetary framework and desire for long-term financial sustainability. As such, the solution can be priced on an annual subscription basis, as well. ICW would welcome the opportunity to conduct a thorough business requirements analysis and from that will be able to provide a specific pricing proposal, at the appropriate time in the process. ICW is confident that its pricing is extremely competitive relative to similar solution providers, and should ICW emerge as the CA-DMH "vendor of choice" for its EHR and PHR solution, then we will work closely with CA-DMH to ensure that it meets CA-DMH's needs from a financial, as well as a technology, perspective.

RR-M-02 List any programs your corporation currently participates in, in which you provide a single pricing and licensing model for a large customer with decentralized purchasing (public or private sector), and functional descriptions of that model. Examples of this type of licensing/procurement program may be the State of California Software License Program (SLP), or the California Strategic Sourcing Initiative.

None at this time.

N. Risks and Issues

(Not to exceed 3 pages)

RR-N-01 It is fully expected that Counties will encounter risks/issues that they must manage and mitigate. Please identify the risks/issues that a County is most likely to encounter when implementing your solution. Please include examples from prior implementations of your solution.

There are many possible risks and issues, here are a few in our experience:

- Data quality
- Resources:
    - IT infrastructure (hosting, networking, hardware)
    - Support staff

- Technical staff
- Operations:
  - System releases, patches, updates
  - Support
  - End-user training

O. Project References

RR-O-01 Provide a minimum of three (3) previous implementations of your solution that most closely approximate a CA County Behavioral Health setting. Include a California reference if available. Provide names and contact information of individuals who have sufficient experience to speak knowledgeably concerning:

1. The implementation process.
2. System functionality.
3. Vendor support.
4. Documentation.
5. Training.
6. Overall customer satisfaction.

> ***"The health card pilot system was implemented right on schedule within a tight timeframe."***
>
> ***Prof. Radoslav Gaidarski***
> ***Bulgarian Minister of Health***

InterComponentWare (ICW) is a leading international eHealth specialist. ICW develops and distributes software and hardware components for networking solutions for hospitals, physicians, payers, and patients.

Below are examples of ICW projects in Europe and the US:

German Federal Ministry of Health (BMGS)
The BMGS enlisted the help of a number of IT organizations—among them, IBM and SAP—for a project known as "better IT for better health", or bIT4health, to network the German healthcare system. ICW was tasked with the architecture of the connection points of the solution. This included the electronic exchange of information between EDP systems in medical practices, pharmacies, health insurance providers and regional health information organizations. This project is still in the design phase.

Bulgarian National Health Card project
ICW is currently building the e-health infrastructure for the country of Bulgaria. The initial phase of this 3-year project includes the implementation of an electronic health portal and personal health record for the 40,000 employees of the State administration. Other phases include the implementation of a national eHealth card and the rollout of LifeSensor PHR to every Bulgarian citizen.

German GP Association
In 2007, ICW provided the integration layer of our product Professional Exchange Server to connect 50,000 general practice physicians to a GP online network. The network improves the process and profitability of sign-up models, agreements on GP-centered care and integrated care contracts. The new network is not only open to GPs but to all healthcare providers for the exchange of medical information.

BKK Hoesch

With approximately 120,000 policy holders, BKK Hoesch is one of the largest health insurance funds in Germany and has been using ICW CDM for its Disease Management Program (DMP)

since November 2006. ICW CDM is used in asthma and breast cancer programs. Beginning in the second quarter of 2007, BKK Hoesch added programs for diabetes and coronary heart disease via a solution jointly developed by ICW and 4Sigma. ICW CDM helps the health insurance fund efficiently implement DMP's that contribute to improved outcomes, both quantitatively, reduced numbers of at-risk patients developing the disease, and qualitatively, improved quality of life for chronic disease suffers.

Regional eHealth Network of Walldorf, Germany
ICW provided interoperability solutions deploying Professional Suite to providers, practitioners, pharmacies and, via LifeSensor, patients throughout the Walldorf region.

Regional Health Initiative of Rhein-Neckar, Germany
This project was an extension of our work in the Walldorf region. We expanded the interconnected region to include Heidelberg and Mannheim. The project included connecting 1,200 physicians, 250 pharmacies, 71 hospitals and 2.3 million citizens. Later, we deployed another instance of Professional Suite to connect Heidelberg University Hospital with the health centers of Rhein-Neckar.

"With LifeSensor, we are already seeing the essential advantages of digital communication between health service providers and patients today. We expect the success of this program to provide a blueprint for an electronic health record and card program throughout Germany."

Dr. Elmar Schmid,
Initiator of the Patient Partner Association

Bavarian Patient-Partner Association (PPV)
In 2005, through partnership with health insurer AOK Bavaria and the PPV, ICW developed and deployed a network utilizing PXS and LifeSensor to facilitate communication between physicians and patients. In 2006, a study conducted by the University of Erlangen concluded that the PPV is the leading medical practice network in Germany with respect to management, structures and IT.

AOK PLUS

In Germany alone, about 1.8 million people are afflicted with chronic heart failure. AOK PLUS, a German health insurer commissioned ICW to implement CDM as their telemedical system to care for serious chronic heart failure cases in the German state of Saxony. Together with its project partners Sanvartis and Saxonia Systems, ICW ensures comprehensive telemedical 24-hour care by order of AOK PLUS as the participating physicians' service provider. Members receive a blood pressure meter and a digital scale for monitoring their disease. The telemedicine devices transfer the patient's readings using a wireless and encoded system to a base station in the home, which then transmits the encoded data via a regular telephone line to a telemedical center where medical professionals monitor the data and intervene if required, with care steps set-up by the practitioners and facilitated through CDM's sophisticated workflow rules.

Partnership for the Heart

ICW is the technology lead for the "Partnership for the Heart" program. The program implements an early warning system for patients diagnosed with congestive heart failure (CHF) in the region surrounding Berlin. The program was developed

"We hope to develop specialized intense care management methodologies that bring proven results to patients, providers and health plans. We can't accomplish these goals without exceptional technology. ICW's ten-year experience with providing proven eHealth solutions, along with their experience with other cardiac care projects, makes them the obvious partner for Coventry's new program."

Dr. Vishu Jhaveri
Executive Vice President and Chief Medical Officer, Coventry Health Care

to take advantage of the capabilities of monitoring devices to alert physicians when there is a significant deterioration of cardiac function in CHF patients. The solution implemented by ICW uses Remote Patient Monitoring and offers an objective "early warning system" for cardiac deterioration and enables the timely and potentially life-saving adjustment of therapy. Working with device manufacturers, wireless networking experts and physicians, ICW helped develop the Partnership for Health program, using ICW CDM and LifeSensor Personal Health Record

US Experience

"LifeSensor, as an integrated PHR, fully supports the concept that healthcare providers and patients are equal partners in monitoring and managing patients' health."

Dr. Charles Eaton, M.D. M.S.
Professor of Family Medicine at the Warren Alpert Medical School of Brown University and Director of the Family Care Center at Memorial Hospital of Rhode Island

Torrance Hospital Independent Practice Association (THIPA) Medical Group
ICW is working with THIPA to deploy Professional Exchange Server (PXS) to create a centralized healthcare information network for 138 primary care physicians, 258 specialty physicians and 60,000 patients. The THIPA project also includes integration with third-party products for single sign on, demonstrating the openness and flexibility of the PXS architecture.

Coventry

Coventry Health Care Inc., the fifth largest insurer in the US, initiated a home health telemonitoring program that relies on ICW's interoperability platform and integration solution. Coventry's pilot program features the deployment of home health medical devices to congestive heart failure (CHF) patients in a defined geographic region, along with care management services and patient data exchange for the physicians. This proactive pilot is designed to align member, physician and health plan incentives, resulting in improved and timely access to physician care.

Memorial Hospital of Rhode Island

ICW and the Brown University Medical School at Memorial Hospital of Rhode Island, entered into a strategic collaboration to develop and test a patient-centered, eHealth model of care. The key objective was to show evidence of improvement in quality of care and patient safety by integrating the LifeSensor Personal Health Record (PHR) to the hospital Electronic Medical Record (EMR). Following the pilot project, the team has plans to extend the level of integration to a broader multi-stakeholder and interoperable heath information exchange.

ICW and Memorial Hospital of Rhode Island have enrolled 200 diabetic patients in the long term study. Noteworthy aspects of the pilot include:

- GE Centricity hospital EMR integration into LifeSensor PHR
- Additional providers can use same integration process
- Glucometer and blood pressure device integration directly uploads data into the PHR for physician and patient review
- Increased patient involvement in treatment
- Increased patient to provider communication

Appendix A

Addendum 1 - PXS Hardware and Software Requirements.pdf

Addendum 2 - CDM Hardware and Software Requirements.pdf